

# **Information Technology Support for Transformation in Higher Educational Institutions in South Africa**

by

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## **Abstract**

Higher Education Institutions (HEIs) have been in a state of change, and in South Africa, the term “transformation” is used to describe the changes occurring. These changes have implications for the structure, processes and focus of HEIs, and as such have implications for Information Technology (IS/ICT) support for HEIs. IS/ICT support for organisations is predicated on several factors, such as effective informational and technical support at all levels of the organisation, but especially support for the strategic goals of the organisation (alignment). For organisations in a state of rapid change other issues need to be considered, such as flexibility, and new and diverse information and communication needs. This paper investigates the use of Information Technology to support HEIs in transformation.

The research examines factors that make HEIs less amenable to rationalist techniques such as mixed management styles and a “different” value chain. The difficulties for IS/ICT support of HEIs at all managerial levels is discussed, especially the issue of alignment with institutional goals. Thereafter, transformation of HEIs and the possibility of IS/ICT support in achieving the ill-defined goal of transformation is examined.

The research uses management and IS/ICT theories such as the widely used and reported Porter’s value chain, Anthony’s information model, and Minzberg’s organisational model to suggest an analysis model for HEIs (Applegate, McFarlan and McKenney, 1996; Minzberg, 1979; Ward and Peppard, 2002). Furthermore, from the analysis of the literature, a model of antecedent factors for successful HEI transformation supported by IS/ICT is proposed. The research makes use of a comparative case study approach in which 3 (three) South African HEIs are investigated through the “lens” of the developed model.

The major finding of the research is that the potential use of IS/ICT support for HEIs is not optimal in the three cases examined. Results of the analysis suggest that

- IS/ICT alignment with organisational goals at HEIs is low and holistic IS/ICT strategic management is lacking. The areas of Knowledge Management and

Communication Management are conducted informally and Knowledge Management, especially, is not fully exploited.

- The greatest area of concern is the lack of IS/ICT support for academic management, where academics are increasingly required to perform administrative and managerial tasks.
- The merger/incorporation information needs have not caused major system problems, but other intangible aspects of the mergers/incorporations could be better supported by IS/ICT.

The research concludes with a set of actions that should ensure a higher level of support, amongst which are the more holistic management of IS/ICT especially for Academic management needs, and particularly the use of IS/ICT in innovative ways to overcome the challenges of the “transformed” Universities:

There are areas of excellence but the full possibilities afforded by technology are not exploited maximally in support of transformation. Research suggests that the reasons for this are mainly the lack of holistic strategic management of IS/ICT.

## **Keywords**

Higher Educational Institutions; Information Systems and Information and Communication Technologies; Strategic Management of Information Systems; transformation; alignment; support.

## **Declaration**

I declare that *Information Technology Support for Transformation in Higher Educational Institutions in South Africa* is my own work, that it has not been submitted before for any degree or examination in any other university, and that all the sources I have used or quoted have been indicated and acknowledged as complete references.

Rina Annette Roets

August 2006

Signed .....

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## **Glossary and definition of terms**

### **Architecture**

The term used in this report applies mainly to the hardware and communication infrastructural architecture, as well as systems software. It is differentiated from Application Systems.

### **Consumerism**

“... a desire for consumer goods”

(Encarta)

“.... the tendency of people to identify strongly with products or services they consume, especially those with commercial brand names and obvious status-enhancing appeal, ..... It is a pejorative term which most people deny, having some more specific excuse or rationale for consumption than the idea that they're "compelled to consume"”(Wikipedia, 2004).

“Serving consumer needs and interests ... the individual comes first”

(Magrath, 2000: 252).

Writers generally use it to indicate a customer-centric approach, which aids in the sale of products and service by improving the customer experience. This is the meaning that the author will assume.

### **Higher Educational Institutions (HEIs)**

This term is used interchangeably with Universities, academic organisations and institutions throughout the report.

### **IT Division**

The term is used to indicate the support unit dealing with information, information systems and information technology and is used interchangeably as the “IS/ICT function” or “IT Unit”, unless there is a need to differentiate between the three components.

## IT Governance

“Specifying the framework for decision rights and accountabilities to encourage desirable behaviour in the use of IT” (Weill, 2004: 2).

“The IT governance framework says which people in the organization (not just in the IT department) are entitled to make decisions and subject to what constraints (both policies and finance)” (Flint, 2005: 2).

“A structure of relationships and processes to direct and control the enterprise in order to achieve the enterprise’s goals by adding value while balancing risk versus returns over IT and its processes” (IT Governance Institute, 2000).

## Transformation

“a complete change, usually into something with an improved appearance or usefulness (Encarta)

The definition used in this report will be “To change greatly, the nature, condition or function, in appearance or form, usually for the better”.

## Wiki

Wiki is described as a set of linked web pages created incrementally by a collaborative group and is seen as a contender for being a major collaborative tool in Knowledge Management.

## **Abbreviations and Acronyms**

Ac – Academic at levels lower than senior lecturers

Ad – Administrators below level of Directors of support services

BSC - Balanced Score Card

CHE – Council for Higher Education

CRM – Customer Relationship Management

CSF – Critical Success Factors

ExMgm – VC’s office (VC, VP) and executive management committee

- HBU – Historically Black Universities
- HEQC – Higher Education Quality Committee
- HEMIS – Higher Education Management Information Systems
- HWU – Historically White Universities
- IP – Intellectual Property
- IS – Information software and systems
- ICT – Information and Communication Technology (hardware, communication and networking technology)
- IS/ICT – Information Systems and Information and Communication Technologies
- ITMgm – IT Directors, Managers of Web services, Managers/Directors of Software systems, Support Managers
- IT – Information Technology (used interchangeably with IS/ICT)
- KSF – Key Success Factors
- MIS – Management Information Systems
- NRF – National Research Foundation
- SAC – Deans, Senior lecturers and Heads of Departments
- SAd – Senior Administrators at Director level and above, such as Registrar, Human Resource Director, Planning Officer, Director of Operations, and Director of Finances
- SIPM – Strategic Planning for the IT function (broadened beyond what it is known as SISP used for as Strategic Planning for Information Systems)
- SLA – Service level agreements
- Stud – Students
- VC – Vice-Chancellor, Rector
- VP – Vice-Principal, Pro-Vice Chancellor, Vice-Rector



## **Nomenclature**

The terms African, Black and White are used as designated by the State in terms of demography and history of HEIs in South Africa. The term African refers to people of black African descent. The term black is used, as in the local usage, to denote people of African, Asian or mixed (Coloured) descent. White refers to people of European descent.

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# Chapter 1 Introduction

## 1.1 *Motivation for the study*

Higher Educational Institutions (HEIs) worldwide faced huge and new challenges (Allen and Boynton, 1991). South African universities are now facing similar challenges exacerbated by the political, and thus educational, environment peculiar to South Africa (SA) at present.

HEIs in SA have to change, and need or have strategies to enable this. Can Information Technology (comprising hardware, software, people and processes) (IS/ICT or IT), defined in the broadest sense, support HEIs in order to facilitate a transformation process that will allow the institutions to survive and flourish? IS/ICT has changed and advanced dramatically, and affords new opportunities and risks for organisations. How can these be applied to the challenges above?

Evidently, IS/ICT should be exploited fully to support an organisation operationally, managerially and strategically. To achieve this, it is generally accepted that alignment of IS/ICT strategies and operations and organisational strategies and processes is necessary. In a stable environment, this is difficult, and much research has been done in this area. In a changing environment, new challenges are experienced. A transforming HEI environment in South Africa could pose unique challenges and opportunities for IS/ICT. Are the advances in technology being utilised to their best advantage? What are the perils and disadvantages that accompany these technologies?

## 1.2 *Field of research*

The field of research is therefore: HEIs, Information Technologies, strategic management of IS/ICT and support for organisational strategies and operations in a transformational HEI environment of change and mergers in South Africa.

### **1.3 Background of the research**

The context of the research is that of IS/ICT in the South African HEI environment in the early years of the 21<sup>st</sup> century. This context is categorised on the one hand, by the advances in IS/ICT, the increasingly pervasive use of IS/ICT, a focus on the use of web technology and eCommerce, the speed of technological change and innovation, and, on the other hand, by issues facing HEIs in a changing environment of globalisation fuelled by advances in Information Technology (IT), dwindling resources, and issues of public accountability (Clark, 1998; Sporn, 1999a).

In South Africa, the changes or transformation required have further dimensions. The term transformation includes, more or less explicitly, increased access, Africanisation, local relevance, more embracing/transparent governance (Council for Higher Education - CHE- Report, 2000; Department of Education, 2002) and employment equity as core to transformation. It must be said that these transformation goals are shared by most South African organisations and are not peculiar to HEIs. What complicates matters is that a large proportion of HEIs are in the process of Government enforced amalgamation, and this adds extra complexity to strategies for surviving and prospering (Council for Higher Education -CHE- Report, 2000; Department of Education, 2002). Authors report on the need for organisations to be flexible to survive and be competitive, and to build this flexibility into their strategic planning (Evgeniou, 2002). HEIs are not exempt.

HEIs have espoused management principles to cope in a complex environment, a trend towards “marketization of institutions where institutional governance is now the domain of professional managers who aim to mitigate risk while remaining competitive” (de Boer in Wagner and Newell, 2004: 307). This is no different in South Africa. Tensions, however, remain in the way HEIs are managed as this “business” philosophy counters the traditional independence of academic units, and in South Africa, the moral need for redress and greater community involvement.



## **1.4 Scope**

The focus of this research is on HEIs in South Africa, and is concerned with the general area of IS/ICT support for organisational activity and the management thereof. The specific area of IS/ICT support for teaching will be touched upon, but is not the main focus of this research. Transformation in teaching is certainly pertinent, but the focus of the work is on the management aspects of IS/ICT and HEIs.

## **1.5 Goal of the research**

The purpose of this research is to determine how IS/ICT can support successful transformation of HEIs in South Africa.

The goal of the research is therefore to:

- Examine the specific nature of HEIs, and how amenable this is to managerial principles and methodologies with respect to support by IS/ICT for organisational goals.
- Propose a model or framework for IS/ICT in HEIs to address transformational issues.

### **1.5.1 Premises**

The environment in which organisations operate has become more challenging and is changing fast. Organisations have to adapt to this dynamic environment and respond competitively. HEIs share to a certain extent the new challenges faced by business organisations. HEIs have been forced to become more open (where previously they were reasonably closed systems). Operating in South Africa poses unique challenges that require flexibility and change.

IS/ICT is a means of supporting operational functions and strategic management of organisations. It is also a means of leading organisational strategy. The expressed view of the importance of IS/ICT is high, but the pendulum in organisations has swung away from viewing IS/ICT as a competitive tool. It is primarily viewed more warily as an

expensive, if necessary, support for operations. However, IS/ICT is also seen as transformational or disruptive technology (Kaludis and Stine, 2000).

## **1.5.2 Problem statement**

How can IS/ICT support HEIs in South Africa (SA) at present, particularly related to change and transformation?

## **1.5.3 Sub problems**

### **1.5.3.1 Challenges faced by HEIs in South Africa**

**Sub-problem 1:** What are the challenges faced by HEIs, particularly in South Africa, in the changing global environment?

**Premise:** HEIs are being faced by massive change drivers especially in South Africa.

### **1.5.3.2 Management techniques in the context of change**

**Sub-problem 2:** What management techniques are used to enable organisations to survive and flourish in the context of change and how can IS/ICT support organisations in this context of change?

**Premise:** Proven management techniques exist to support organisations specifically in changing circumstances.

**Premise:** IS/ICT can support organisations in adapting to or in initiating change.

### **1.5.3.3 Management techniques applied to HEIs**

**Sub-problem 3:** How can the preceding management techniques, particularly with regard to strategic management, be applied to HEIs, given their arguably more complex structures?

**Premise:** Management techniques can be applied to HEIs, and can provide useful insights.

**Premise:** HEIs are, in general, not being managed strategically because they are “different” organisations. The level of strategic planning is low.

**Premise:** Alignment is vital for IS/ICT to support organisations for all levels of strategic management – from planning and analysis to implementation and control.

#### **1.5.3.4 IS/ICT support for HEIs**

**Sub-problem 4:** How can IS/ICT be managed strategically in HEIs in order to support transformation and to meet the challenges of the changing context?

**Premise:** IS/ICT strategic planning and alignment is in its infancy in HEIs in South Africa, but at the same time the level of strategic planning required depends on the nature and context of the HEI. IS/ICT strategic management, specifically to support change, has not been used widely enough in South Africa in HEIs.

**Premise:** The IS/ICT tools available for efficient (customer driven) systems are not being used adequately in administration or core processes.

**Premise:** In order to adapt and flourish in a changing context, organisations need to be responsive, and their decision-making processes need to be efficient and effective and IS/ICT can support this need. This is not happening in the case of HEIs. In addition, the peculiar management needs of HEIs are not being sufficiently addressed.

**Premise:** In order to adapt and flourish in a changing context, a “learning” networked organisation is reported to be the most successful. HEIs, despite their very nature as organisations of knowledge and learning, are not supported adequately as learning organisations in terms of Knowledge Management (KM) and Communications Management (CM). Similarly KM and CM are not being used to support a transforming or unifying culture. In addition, the information behaviour of the organisations does not support electronic KM and CM.

## **1.6 Method of Research**

### **1.6.1 Scope of the literature review**

This research firstly employs a literature survey to determine:

- The challenges facing HEIs and their management particularly in South Africa.
- Theories on the alignment of organisational and IS/ICT planning and strategies.
- The meaning and implications of the term “transformation” particularly in a South African context.
- The use of IS/ICT in HEIs.

A model/framework is devised to answer the challenge of aligning HEIs and IS/ICT at strategic, management/administrative, and operational levels in order to achieve successful transformation.

### **1.6.2 Research methodology**

This research thereafter uses a positivist case study method that is based on semi-structured interviews as well as brief surveys. The research methodology is discussed in greater detail in Chapter Seven.

#### **1.6.2.1 Pilot study**

Two questionnaire-based surveys were applied to HEIs in South Africa, in order to assess common issues. Thereafter a set of interviews were conducted at a specific HEI. The purpose of these interviews was exploratory, as defined by Yin (1994). The issues focused on in interviews were the information usage of the organisation with reference to decision-making and organisational learning, as well as strategic and operational issues in terms of transformation. Results from the above two exercises were then combined to form the protocol for the in-depth case studies to follow.

### **1.6.2.2 Case studies**

Three in-depth case studies have been conducted at HEIs. These case studies were conducted by the writer/researcher solely in most cases except where indicated otherwise. These studies focus specifically on (adapted from Sporn, 1999b):

- The vision, mission and strategic objectives of the HEIs especially and their context with respect to the need to achieve transformation or change.
- The strategies in place to achieve their objectives and specifically goals of transformation and change.
- The administrative and management processes and structures required to support these goals.
- The information and therefore IS/ICT support needs, and the impact at operational, tactical and strategic levels in order to support the strategic goals for change.

### **1.6.2.3 Subjects of the studies**

The two survey questionnaires were applied to a range of universities and technikons. The interviews for the pilot investigation targeted staff of a historically white university (HWU), well known to the author as it was thought that it would be possible to obtain information successfully. It is recognised that it is a risk to do research in an organisation to which the researcher is affiliated. However, in this case as the author was shortly to leave the employ of the organisation, that risk of subjectivity decreased.

Thereafter the three Universities approached for the case studies were the following: Firstly, the same HWU as in the pilot study (but with different participants) exemplifying a HEI operating in a fairly stable context. Secondly, a historically black university (HBU), somewhat similar in size to the first university, but which is transforming more radically, is examined. Thirdly, a HWU which is also transforming radically (but larger in size than the previous two HEIs) is examined.

As far as possible, similar types of respondents are interviewed at all three institutions from executive management, senior administrators, academic leaders, teaching staff and students.

Finally, the proposed model is evaluated in the light of the case studies.

#### **1.6.2.4 Researcher**

The research is conducted by the author. Two Honours students in the Department of Information Systems to which the author belongs were used for limited help in the final case study (UFS), with respect to questionnaire administration and capturing of comments arising during completion of the questionnaires.

### **1.7 Organisation of the research report**

The research report starts with a literature survey focused on the research problems identified in 1.5.2. It then continues by formulating a model, indicating the research method to be pursued to validate the model, and then describes the three cases selected through the lens of the model.

#### **Chapter 2: Transformation of Higher Education**

This chapter examines the challenges which have faced HEIs globally, and then focuses on those in SA.

#### **Chapter 3: Information Technology in a changing environment**

This chapter examines changing management principles and techniques. It describes the use of IS/ICT in support of strategic, tactical and operational management and specifically the issue of alignment and flexibility.

#### **Chapter 4: IS/ICT in HEIs**

This chapter discusses the reported use of IS/ICT in HEIs, with special reference to the peculiarities of HEIs. The results of pilot studies are reflected here.

## **Chapter 5: Proposed framework and model**

This chapter proposes a model for the support of HEIs by IS/ICT at strategic, tactical and operational value chain levels.

## **Chapter 6: Research methods**

The research method is dealt with in detail in this chapter.

## **Chapter 7: Case Studies and Comparative Analysis**

The three case studies used for this research (and shown in detail in Appendices C, D and E) are compared in this chapter to consider support for the proposed model. Although this chapter is better read in conjunction with the three appendices, it may also be read in isolation.

## **Chapter 8: Conclusion**

The conclusion contains recommendations flowing from the analysis of the case studies and an adaptation of the proposed model, highlights limitations of the research, and makes suggestions for further research.

## **References**

### **Appendices can be found on the CD supplied.**

Appendix A contains the results of the pilot study surveys and initial exploratory interviews.

Appendix B contains the interview protocol and questionnaires that were applied to the three cases.

Appendices C, D and E report on the case studies. The three HEIs are described as cases, given the model and frameworks of Chapter Five. These three appendices serve as the detail on which Chapter 7 is based.

Appendix F contains fuller descriptions of South African institutions relevant to and referred to in the cases.

## **1.8 Rationale for the research**

The use of IS/ICT has major potential for innovative exploitation by HEIs especially in a country like South Africa that is facing unique challenges. This research attempts to analyse and suggest areas where IS/ICT can be used.



## **Chapter 2 Transformation of Higher Educational Institutions**

### **2.1 Abstract**

The chapter examines the global context in which Higher Educational Institutions operate, and focuses specifically on the changes occurring in this context. It then examines the context of Higher Education in South Africa, and concludes that the South African context is more complex as changes occurring globally are exacerbated by (dramatic) local changes. This creates the need to be dynamic and adapt rapidly to these changes – which could be foreign to the nature of such institutions.

### **2.2 Introduction**

Changes in the world have had an effect on education globally. These changes have inevitably extended to South Africa.

This chapter examines the environment affecting Higher Educational Institutions (HEIs) at the beginning of the 21<sup>st</sup> century. It focuses on the global issues and their pertinence to Higher Education in South Africa. It then identifies issues unique to South Africa.

The issue of transformation of HEIs is examined in this chapter. A definition for transformation is sought with respect to HEIs in South Africa and is used in this research as encompassing dramatic change, but driven by the needs of the State. Universally in HEIs, the term transformation has been equated with the way HEIs have had to change in order to cope with diminished State funding. In South Africa, this meaning is loaded with other meanings given the history of South Africa. It includes issues such as improving access to HEIs, redressing demographic inequalities of staff and students, relevance to local needs of research, specifically, but also relevance for the skill needs of the country and issues of quality.

The purpose of this chapter is to indicate the drivers for change that exist for HEIs in South Africa at present. It examines the literature in respect of the first sub-problem and

premise stated in Chapter One: “What are the challenges faced by HEIs particularly in South Africa in the changing global environment? - Premise: HEIs are being faced by massive change drivers especially in SA”, one of which is the transformation imperative of HEIs.

### **2.3 Global changes**

Momentous events have shaped the end of the 20<sup>th</sup> and the beginning of the 21<sup>st</sup> centuries. Chosen at random, there was the Thatcherite era, the end of the Iron Curtain and Apartheid, the expansion of democracy and capitalism, the growth of the European Union, September 11<sup>th</sup> and the rise of international terrorism and multinational crime, rapidly advancing technology, globalisation and anti-globalisation, AIDS, the Middle East wars, and the energy crises. Economy and business has (in the West) moved from a production economy to a service economy. Attendant on the service economy has been a greater focus on consumer needs and the protection of the rights of consumers, as well as the growth of consumerism (see Glossary for a definition).

ICT has played a big role in these changes. The advances in ICT have spurred globalisation, international trade and multinational consortia, giving rise to a focus on management of international supply chains as well as of multi-culturalism. Globalisation has resulted in increased competition. The term globalisation carries diverse meanings. The term is used in this report to indicate an increase in international trade and a weakening of national boundaries (Nkopodi, 2002; Ntshoe, 2002a) while ignoring, but not disputing, other connotations of the term.

Because of globalisation, events in one country affect organisations operating elsewhere: events such as the Enron scandal have resulted in the call for public scrutiny, transparency and accountability. ICT's role has further changed ways of doing business. Exponential use of the Internet has given rise to eCommerce. International crime enabled by ICT and the lesser irritations of hacking and computer viruses have resulted in a greater need for control of security related to ICT. The fast rate of change of

technology, the environment and the markets has led to the need for organisations to be flexible and able to respond rapidly to new opportunities (Magrath, 2000).

The features of these changes that are germane to this research are the focus on efficiency in business, globalisation and attendant competition, the focus on consumers and consumers' demands for ICT enabled business, and the need for greater accountability and flexibility. ICT security is also a pervasive issue.

The next section examines HEIs, and then the changes in the operations of HEIs caused by the issues mentioned above.

## **2.4 *Changing nature of HEIs***

### **2.4.1 Traditionally**

The ideal university was seen to be an institution operating in a collegial fashion with democratic (committee) decision-making under the banner of academic freedom. Academic freedom is, as defined by Davie, the freedom to decide what and how to research, whom to teach, what to teach and by whom (in Pereira, 1999). The university was the sole creator and repository of knowledge. Put more elegantly, Newman in the 1850s, (in Greaves, 2002: 1) writes that it is “a place for communication and circulation of thought, by means of personal intercourse”. Its main function was to create new knowledge and to disseminate this through small class (usually) teaching and seminars. It was the place “in the world where the argument of intellectual reason, humanistic values and political detachment are respected” (Sadlak, 2000: 245). Quality was vital (despite the contested meaning of the word), but this was internally judged by peers under the mantle of academic freedom. Students were admitted based on proven ability and were an elitist and homogeneous group of young adults usually, but not exclusively, from middle-class or upper-class homes. Critical thinking in students was nurtured and valued above workplace skills.

This image of HEIs is largely British (the organisation, governance and management of Universities have varied from country to country). In Britain until the late 1900s, universities were characterised by various factors:

- Decision-making involved Faculty and Senate. Decision-making was slow with all avenues being explored before action was taken. The Vice-Chancellor (VC) had to operate with very little hierarchical power;
- Academics were not involved in administrative functions;
- The structures and policies to reward or punish poor performance by academics were limited;
- Little or no quality checking occurred (especially externally imposed). External checking was done, for example, through peer evaluations and external examiners, but these could be chosen arbitrarily;
- Student input into matters of management and administration was slight;
- Since 1963, universities were totally funded by the State with no requirements for efficiency and pragmatism (Dearlove, 1998). Older universities were wealthy in their own right from accumulated reserves. The State had minimal influence. The reforms contained in the 1997 White Paper (in Swartz, 2005) were devoted to efficiency improvements and closer links with industry, with a specific focus of meeting the employment needs of the country.

In the United States of America (USA), HEIs operated more like business organisations with chairmen and women wielding considerable hierarchical power. The shift from basic research to “civilian” research was encouraged by targeted funding. Also encouraged were joint partnerships in projects between HEIs and government or industry.

In Europe at the end of the 20<sup>th</sup> century, the top officials were appointed and had little power (Askling and Kristensen, 2000). In Germany, the HEIs were directly dependent on their states for funding (Frackmann in Bull, Dallinga-Hunter, Epelboin, Frackman and Jennings, (1994)). In the Netherlands, salaries were regulated by Government (Dallinga-

Hunter in Bull *et al.*, 1994). In France, in particular, the educational system was centralised and bureaucratic with very little local decision-making and Information Technology was centralised, as was human resources (Epelboin in Bull *et al.*, 1994). Similarly centralisation was prevalent in newly developing countries (Lauglo in Bush, 2003). In Eastern Europe, State control was more intense with uniform curricula where, for example, universities were granted autonomy only in the 1990s (Rosenberg, 2002).

In Africa, at many Universities, the post-colonial era saw a changed focus on development studies. The Universities were, however, by and large closely controlled by the State, to the detriment of “critical discourse” (Swartz, 2005).

### **2.4.2 Change**

This image of the role and nature of the University has changed, although debate exists about whether the nature of HEIs has been as static through the ages as believed.

Kivinen and Kaipainen (2002), for example, write that the functions, roles and activities have changed through the ages with at times a great deal of “prostitution of services” for economic rewards.

Cameron and Tschirhart, (1992) describe the post-industrial environment of HEIs as typified by complexity, turbulence and decline caused by high competition, scarcity of resources and unpredictable fluctuations in enrolments and revenues.

The factors mentioned earlier have caused changes in HEIs. Globalisation, the advances in technology, and the changing role of the State appear to have been the biggest interdependent factors causing changes in HE, followed by the demand for public accountability and relevance. In the West, both government and industry are requesting market responsiveness (Swartz, 2005) and efficiencies from such public organisations.

### **2.4.3 Context: Changing role of the State**

As mentioned, the changing role of the State is a major factor in the changes in operation of HEIs, especially in South Africa. State funding is critical for HEI survival, but

funding is also being used to channel the efforts of HEIs in directions that align with what Governments see as important for the country in terms of skills and research.

A commonly quoted “fact” is that strong economies have well-educated populations and that higher education rates yield high economic returns (World Bank Task Force on Higher Education and Society, 2000). Economic development is seen to be linked to the ability of the nation to apply technology and the competitive use of knowledge (Salmi, 2001). Doubts are voiced about the validity of this argument: Van Tilberg questions “whether higher education has supported economic growth or economic growth has supported educational development” (Van Tilburg, 2002: 16). In developing countries, the above reasoning may not apply as well. The report from the World Bank (2000) states that, by contrast, higher education brings fewer returns than primary and secondary education and in such countries higher education is under strain. In Zimbabwe, in the 1980s after independence, the country had a large proportion of the population involved in education, but this did not lead to massive employment or economic growth, possibly because the spending on education was disproportionate in the budget. Thus participation in HEIs can be viewed as a necessary, but not sufficient, condition for economic growth.

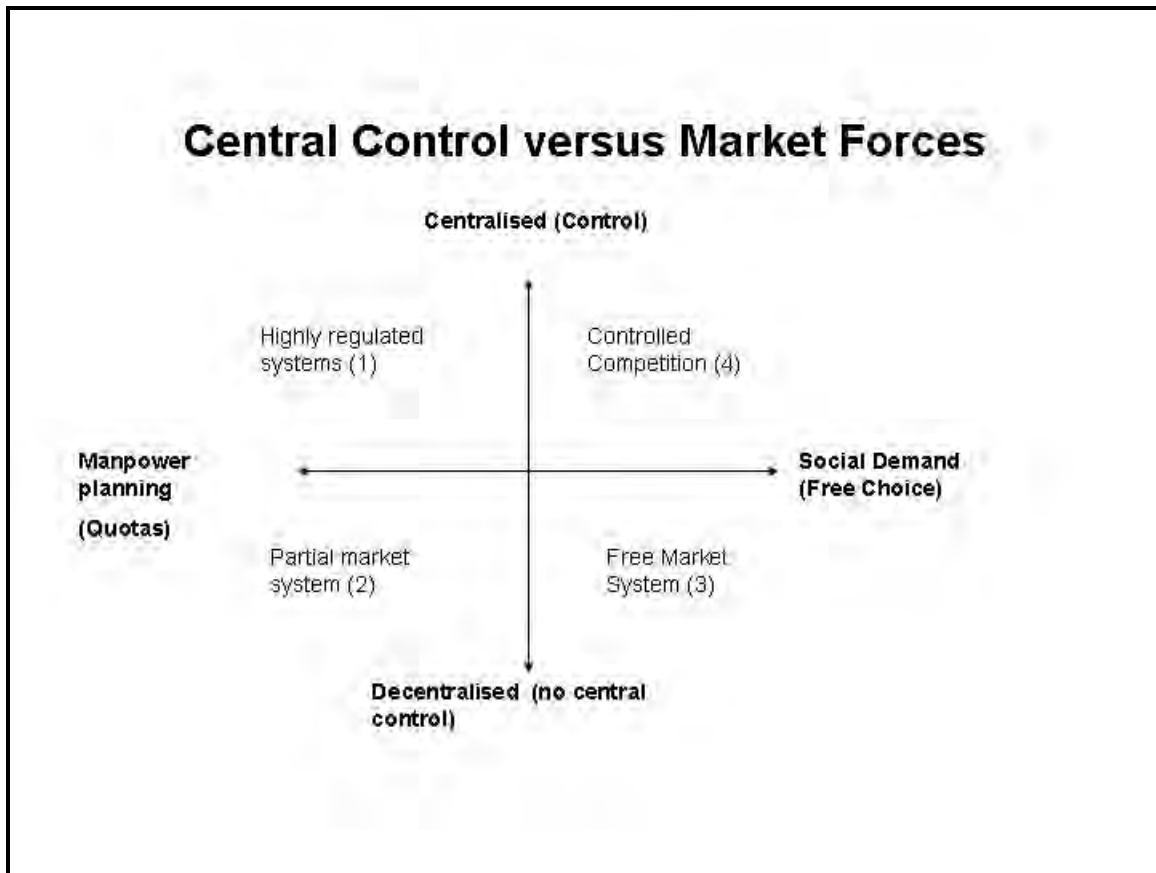
The role of the State varies from country to country. In Europe, the centralised control has changed. Universities moved from total state control and bureaucratic structures to autonomy and collegial structures in the 1990s in Spain, for example (Mora and Villarreal, 2001), while in Sweden the same happened in 1993 (Askling and Kristensen, 2000).

The role of the State in funding research is also interesting. In the USA, the Bayh-Dole Act enables HEIs to “patent any innovation springing from government funded research, license it, and share the spoils with the inventor” (Intellectual property: Bayh-Dole for blood or Doling out cash?, 2005, pp. 115). This has had a major impact. On the positive side is the fact that more than 4,500 firms have resulted from non-profit research institutes based on patents as a result of the Act. On the negative side, it has had the effect of purportedly deflecting HEIs from the pursuit of “pure” research, and of research

being delayed by waiting for patents and royalties arrangements. More significantly, however, it has brought into play lawsuits against “greedy” HEIs that are using such research exclusively, and who should then not be given non-commercial research tax exemption (Intellectual property: Bayhing for blood or Doling out cash?, 2005). “South Africa at this stage does not have a harmonised approach to intellectual property protection, ownership and commercialisation, in respect of inventions arising from publicly funded research” (McLean, 2006). The National Research Foundation set up an innovation fund in 2004 to support patenting activity at HEIs, and the Department of Science and Technology has, early in 2006, published a framework for Intellectual Property (IP) rights for publicly funded research.

In all countries, the direct control by the State has diminished, but indirect control has increased. The mechanism to control the activities of the HEIs has been through directed, albeit diminishing, per capita funding. So, paradoxically, governments are wielding less direct control while shaping the national educational landscape more closely. In Europe since the 1980s, HEIs have experienced more autonomy of the State, initiated by the State itself, but linked with new forms of regulation and allocation of funds dependent on evaluation of functions and results (Gueissaz, 2002). “Accordingly, funding is increasingly used not only as a mechanism for enforcing accountability and control of teaching and research, but also implicitly as a strategy for challenging traditional institutional autonomy and collegiate organisational culture” (Ntshoe, 2002a: 84). Governments have deemed it necessary to shape the Higher Education (HE) environment in line with national interest. The stated motives have been to foster economic growth by increasing the participation rate in HE, by market related programmes, and by fostering socially or economically applicable research. Whether government or the market can predict what is best for individuals or society in terms of education that bears fruit only later is hotly debated, and this state intervention, of course, interferes with the ideal of academic freedom.

Michael (1997) typifies the possible positions of Universities vis-à-vis the State (see Figure 2-1).



**Figure 2-1 Positioning Grid - Michael (1997)**

Centralised state control with manpower planning (the highly regulated systems of Quadrant 1) would ensure that policies exist to ensure that students follow programmes that are seen to feed the needs in the economy. Funding may be provided only for those courses, or HEIs may be prevented from offering any non-approved programmes. Competition between HEIs would not exist as students would be controlled by the State and not their own choices. In South Africa, this could also mean manpower planning for political ends or social needs. This is the direction South Africa is approaching, but with a measure of confusion as the education subsidy seems to waver between trying to meet the demands of the economy and also funding expensive, politically correct, but arguably less economically necessary programmes. Examples of high funding areas include drama



and music. (Previously under Apartheid, there was a curious mix of total State control on the one hand and controlled competition on the other).

Centralised control, combined with social demand, (controlled competition of Quadrant 2) may result in a lessening of State control, allowing students a degree of free choice regarding where they wish to study, and allowing HEIs to decide on what programmes they wish to offer, but still with the State keeping some control of the HEI landscape. South Africa in the latter part of the 20<sup>th</sup> century was possibly in this quadrant.

The free market system (Quadrant 3) assumes that HEIs may offer what they wish and students can attend programmes that they wish. This was the state of play where academic freedom reigned supreme, and state control was minimal. This would imply that those HEIs have sufficient sources of other funding.

The partial market system (Quadrant 4) assumes that HEIs were aware of and sensitive to market needs (perhaps forced to by economic requirements) and offered programmes that were aligned with perceived needs of the country.

## **2.4.4 Results of changing role of the State**

### **2.4.4.1 Diminishing State funding**

Governments in general are spending less per capita on students (Sporn, 1999a; 1999b; Webber, 2000). An example statistic of a 7% decrease in funding in 1996 (announced in 1995) and a 31% decrease in capital funding in the UK is mentioned by Stamati, Kanellis, and Martakos (in Metcalfe, 2006). This has caused HEIs to seek other ways to generate funds. HEIs have adopted a variety of “entrepreneurial” strategies (Clark, 1998) whereby they sell services and form partnerships to generate their own funds. This has led to a tension between the traditional academic activities of universities and the newly recent need to survive financially.

Despite the lower per capital spending, the cost of higher education is rising (Twigg in Rodenacker, 1998). In the USA, the cost to the “consumer” is rising twice to thrice as much as the consumer price index. According to a retired University planner (Smout,

2005), this change is similar in South Africa, although he could not quote hard figures. IT is seen as countering this by making information available and substituting human costs, but this is, of course, debatable as the cost of technology is high.

The result of diminished funding is a search for “third-stream” funding from projects, and what is called the “commodification of knowledge” and the exploitation of intellectual property.

#### **2.4.4.2 Funding of programmes**

The State and business alike are scrutinising degrees and courses and their market value. The economy needs graduates who are of value to the economy and industry. This has led to a call for more market attractive course structures. Applied research is also, and perhaps particularly, being encouraged and rewarded. Targeted State funding has resulted in the promotion of certain programmes in teaching and research.

Industry is also increasing its funding of HEIs, and is becoming more demanding by requiring specific services – courses, training, and research - and is calling for accountability. Calls are made for greater efficiencies and, of course, transparency.

The traditional organisational structures of HEIs are being shaken with a call for inter- and multi-disciplinary programmes and schools. As a result, HEIs have been encouraged to restructure their discipline-based departments and faculties into schools, weakening the traditional departmental/discipline-based approach. It is not yet clear whether this is a beneficial change.

#### **2.4.4.3 Massification and student profile**

Industry has recognised the value of human capital in the ideal of the learning organisation and thus life-long learning. Government in search of economic progress is therefore encouraging or enforcing greater participation at HEIs by those previously excluded by lack of finances, abilities, opportunities, age or maturity, and industry is calling for extended participation. This has led to the so-called massification of HEIs and increased participation in higher education by a large proportion of the population.

Almost universally, as a result, HEIs have grown in size through greater student enrolment (Salmi, 2001). One writer quotes a tripling in size of his institution in the 1990s in the United Kingdom and notes that this was a modest growth compared to others (Lauwerys, 2002). Together with the growth in student numbers, the number of institutions has grown. In the United Kingdom, for example, there were 16 universities in 1946 dealing with 28000 fulltime students, and in 1996 there were 115 universities and 61 other HEIs enrolling 1.6 million students (Webber, 2000). Sadlak (2000) quotes Tysome, noting that there were 51 million students in the world in 1980, but 82 million in 1995 – a growth of 61% – and expected to be 97 million in 2010. Population growth for the world between 1980 (4.45 billion) and 1995 (5.68 billion) was 78% (the figure for the same period for the USA was 86% growth rate and Europe taken from 1950 to 1998 was 75%) (GeoHive; NPG).

With this growth, the student profile has changed due to an ageing population, especially in developed countries. The International Association of Universities notes that almost half of the student population in the United States consists of mature or part-time students (International Association of Universities, 2002).

Massification and more diverse student populations have challenged traditional University teaching and caused an examination of how IS/ICT can assist in meeting the needs of huge classes and students with different educational backgrounds.

#### **2.4.4.4 Competition and globalisation**

The necessity to generate funds has led to competition for resources, and the push for massification has led to competition for (funded or paying) students.

In some countries, regulations have been relaxed to allow HEIs to operate outside their geographical locations. Salmi (2001) notes the attractiveness of internationally recognised qualifications, the growth of on-line universities, offshore franchised courses, and the growth of private institutions in Germany as an example.

A plethora of private institutions have sprung up to challenge HEIs especially in market-related disciplines in which courses are inexpensive to mount. Commerce and MBA programmes are good examples (whereas engineering and medicine are expensive to run). Webber (2000) writes that the producer-led assumptions that supported universities have been replaced by consumer-led competition. In addition, the so-called corporate universities have been established. An example is the Oracle University, which competes with HEIs in skill-based subjects.

These statements and opinions are supported by a report in the Economist (Free degrees fly, 2005) regarding institutions operating in foreign countries, and which can also be used as an indicator of the level of State control (Table 2-1).

<b>Regulatory framework for foreign providers of Higher Education</b>	
No regulations: Foreign providers free to operate without seeking permission	Austria, Czech Republic, Denmark, France, Indonesia, Mexico, Nigeria, Portugal, Russia
Liberal: Minimum conditions only e.g. recognised in own country:	Argentina, Bahrain, Estonia, Finland, Latvia, Netherlands, New Zealand, Norway, Sweden, Switzerland, Britain, USA
Moderately liberal: Formal rules but not burdensome	Australia, Bangladesh, China, Egypt, Hong Kong, Hungary, Israel, Singapore
Becoming more restrictive	India
Liberalising	Japan, South Korea
Very restrictive	Bulgaria, South Africa, Belgium (francophone), Greece

**Table 2-1 Regulatory framework (Free Degrees Fly: Economist, 2005)**

The point is made in this article that in much of Europe, where students are fully subsidised, the choice of where to study is not determined by the costs, but by perceived

quality. The writer also states that in most countries the idea of State control of higher education “is barely challenged” (Free degrees fly, 2005).

ICT enabled globalisation has allowed greater competition than before, where students can study more easily through distance learning than previously. The core functions of HEIs, namely knowledge production and dissemination, have been changed by technology. ICT offers the possibilities of supporting existing practices of learning/teaching, different means of delivering information and possibilities of innovative new ways of fostering learning (Cameron and Tschirhart, 1992; Clark, 1998; Sporn, 1999b). The rapid advances of ICT and globalisation have led to competition both in the traditional sense of face-to-face learning, as well as allowing alternate means of providing services and thus lowering barriers of entry through web and Internet (distance or on-line) learning by removing the barriers of physical infrastructure and access (Webber, 2000).

As regards knowledge production and dissemination (research and publishing), outside agencies have also eaten into the hegemony of knowledge production. Private organisations have set themselves up to conduct market related research that they sell at a profit and thus compete with HEIs. For example, the Gartner Group and various State departments have overtaken universities in creating knowledge and research. This phenomenon has largely been created by advances in technology. “Universities are minor players in the creation of knowledge which is held in cyberspace and available to all” (Johnston, 1999: 31) and “have lost the monopolies of the knowledge business” (Dunkin, 2001: 2). This has forced greater competition on HEIs for knowledge production.

In addition, ICT has changed the nature of libraries dramatically, and has the possibility of changing the nature of academic publishing with the ability to store research digitally, coupled with the growth of e-journals, and the ease of sharing information (Salmi, 2001). This “commodification of knowledge and services” has resulted in closer links to industry. Publishers hold copyright and the journals that used to be housed at HEIs are now in the hands of for-profit publishers or groups, with universities struggling to

provide these resources to their researchers – especially in developing countries where resources are limited.

#### **2.4.4.5 Mergers**

The need to be economically viable has led to mergers. It is stated that smaller universities have higher unit costs and are therefore less economically viable. One of the ways to achieve a critical mass is to merge institutions. Paterson quotes Light and Gould stating that mergers can afford substantial savings in “purchasing, estates management, student services and IT provision” (Paterson, 2004). Mergers have been either State imposed or actively sought by institutions to boost numbers or expand their programme diversification (Lang, 2002; Lloyd, Morgan and Williams, 1993). The minimum size for an efficient institution is set at 5000-8000 students in Australia (Lloyd *et al.*, 1993). They derived estimates of cost savings resulting from mergers, and noted that for a merger of a small and a medium university, an 8% saving is predicted for Australian universities, although they quote larger savings for American institutions. Considering merging costs, this could be considered small in the short term. Rowley writes that efficiencies through resource rationalisation have not happened (Rowley, 1997).

Compared with mergers in industry, academic mergers are more successful with a success rate of 90%, as compared to 50% in industry. This could be because they are examples of what is termed horizontal mergers, that is mergers within the same industry, which have a low failure rate (Kitching, 1967). Rowley writes that another stated result from amalgamations is the reduction of the number of institutions and increasing homogeneity amongst institutions (Rowley, 1997).

#### **2.4.5 Other changes**

The changes discussed thus far are largely related to the role of the State, and attendant funding or national economic requirements. These changes have led to competition for students and thus massification and merging, a search for third stream income, and

accepting funding from industry which allows greater influence by industry in the type of programmes offered.

ICT and globalisation have increased the effect of competition, and facilitated the provision of education in different ways. It has also facilitated competition in knowledge production (research) and ownership of Intellectual Property (IP).

However, some of the issues mentioned at the beginning of the chapter have also further impacted on HEIs: One of these is the need for greater accountability and transparency of State (and organisational) funding, the need to counteract competition by being flexible, dealing with the rising expectations and demands of consumers of education, and the increasing multiculturalism of students.

#### **2.4.5.1 Changing structures and management**

Transparency and accountability requirements have led to changes in management and staffing.

##### ***2.4.5.1.1 Boards***

Governments and indeed the public require greater transparency and accountability from HEIs given the large (although per capita decreasing) amounts of public money going to the burgeoning institutions. They require greater involvement of external stakeholders in the governance of these institutions as well as the need for better reporting for control purposes. As a result, there has been more inclusive representation on governing Boards. Quality controls and statistics are being demanded (Morrill, 2000). Lauwerys (2002: 2) writes that “the previous reliance on an individual professionally driven approach to core academic and supporting activities has been overtaken by externally imposed highly complex sets of requirements which control more and more of the central processes of a university”.

#### ***2.4.5.1.2 Technical support***

The need to provide quality measures and report on them has resulted in the hiring of a plethora of specialists to interpret and administer these requirements: internal auditors, Quality Assurance (QA) managers, Equal Opportunity and Disability advisers, procurement managers, fund managers, etc. As an aside, measuring quality of education is not as simple as measuring the quality of an assembly line. Philosophical concerns are expressed about the drive to outcomes-based (and therefore more amenable to measurement) education.

#### ***2.4.5.1.3 Administration***

The growth in the size of institutions has caused management and administrative problems. It has led either to an increase in the number of relatively well-paid administrators, or particularly in Britain, an increase in the duties performed by senior academics. In Europe, Sporn (1999a) notes that administration personnel are increasing while academics are decreasing. Borchers (in Metcalfe, 2006) noted a less than 10% administration ratio, as a proportion of the budget in 2002, as a benchmark for HEIs in the United States of America (in a given sector), but others have noted an increase to 25% of non-lecturing staff in the USA. It is not clear whether a benchmark exists internationally.

#### ***2.4.5.1.4 Management style***

A growing trend towards adopting management practices from business in the leadership and administration of HEIs is noticeable: the dreaded managerialism. Deem (1998) is quoted as saying that the United Kingdom (UK) HE system is managerial and bureaucratic. Bush (2003) quotes Warren as stating that collegiality is being threatened by the need for competition, the rise of academic managers and the move towards top-down hierarchical control. Wagoner quotes Birnbaum (in Metcalfe, 2006: 83) as stating that “higher education institutions adopt popular management trends from the private sector before they have been proven effective”.



#### ***2.4.5.1.5 Academic management***

The role of academics has also changed. In some countries and institutions, academics have become more heavily involved in administration, leading to a neglect of what they do best or prefer – research. (A paradox exists here in that academics want to be involved in decision-making, but resent the time needed for committee work).

Loughridge (1996: 5) speaks of a “cultural dissonance” in the new era where statistics are required by administration while academic Heads of Departments (HoDs) see this need for “second-order” information as a waste of time. Loughridge reports on the goals of HoDs where teaching and research were central, and management of resources, maintenance and development of external links, response to external demands, attracting students and positioning their departments in the market-place were also important (Loughridge, 1996).

#### ***2.4.5.1.6 Flexibility***

The need to be adaptable has been highlighted in industry. Sporn (1999b) states that organisations need to adapt to changing environments either reactively or proactively to remain in balance with the environment. Magrath (2000: 251) states that given all the global changes, universities can no longer afford to function as “cottage industries”. Universities need to be flexible as does industry in this ever changing environment (Koornhof, 2001; Salmi, 2001; World Bank Task Force on Higher Education and Society, 2000). Barnett (in Gordon, 2001: 38) writes that “spontaneity, flexibility and communicative reach” are prerequisites in this age of super-complexity.

HEIs, if they are to compete, need to be flexible, for example, in terms of offering courses as the “market” demands. This is an area where HEIs are slow moving. Eriksen (1995) suggests that the traditional batch mode of teaching makes the programmes offered by HEIs more inflexible and inefficient. As a part solution, he suggests that the answer is to have standardised modules that are offered throughout the year, so that students do not lose full years in order to continue studying, if they fail a semester subject, for example.

#### ***2.4.5.1.7 Students as consumer***

As part of the new customer-age of consumerism, and since the student revolution in the 1960s, students are also increasingly seen as “customers” of their education. This is a corollary to the view that Universities are being run like businesses, and causes concern for old style academics. The point made in the Economist (Free degrees fly, 2005: 63) is that Universities are being nudged into changing, but that the view of “the student as consumer is a new and subversive concept in much of the world”.

#### **2.4.5.2 Core operations: Massification, diversity, and teaching implications**

Academics argue that contact between lecturer and students is ideal at the ratio of less than 1 to 30 to produce quality (Berube, 1998; Lloyd *et al.*, 1993). Scott and Scott (2004) note the increasing ratio of students to (teaching) academic staff which, in New Zealand, was 18.3 to 1 in 2002. An OECD publication (2002) notes an average 14.7 ratio for OECD countries (Organisation for Economic Co-operation and Development). The ratios differ for disciplines, but are on the increase as indicated in an AVCC report (2003) where the average for 2002 is given as 21.4, but varying between faculties from 15.1 to 30.8.

The student body has changed dramatically to a much motlier group: it is vastly more diverse in age, experience, and abilities than the previously elitist group. Given the shrinking globe, students are also moving more easily between institutions in different countries, adding to language and cultural diversity (Sporn, 1999b).

This diversity, and often-larger class sizes, has made teaching more difficult with larger teaching loads, again causing problems for research. Academically, this has caused an increase in the complexity of teaching for academics. The perception is that many of these more diverse groups of students are inferior in abilities or readiness to the previously elite group and that academics are called upon to do far more work in trying to maintain the exit standards the good HEIs previously maintained (Lomas, 1999). In some cases, maintaining the same exit standard is not possible, resulting in a decline in the exit standards of students.

HEIs are experimenting with ICT in new ways of teaching and learning (mixed mode, eLearning) largely to cope with diversity in learning styles and growth of the student body, as well as to use ICT to its full potential.

#### **2.4.6 Summary**

Higher education has been transformed in many countries, with the “emergence of new types of institutions, changes in patterns of financing and governance, the establishment of evaluation and accreditation mechanisms, curriculum reforms, and technological innovations” (Salmi, 2001: 105; Webber, 2000). Transformation has been effected variously by restructuring, retrenchments, improved efficiencies and strengthened administrative core, mandated changes, diversification of funds, quality management, entrepreneurial ventures and transformational leadership (Gumport and Sporn, 1999; Sporn, 1999b). Webber (2000) also mentions diversification as a strategy for survival. The need to be transparent and measurably answerable to the State and industry has eroded academic freedom. As Dearlove comments: “Argument for academic freedom at public expense now carry very little clout” (Dearlove, 1998: 69).

### **2.5 *Developing countries and HEIs***

HEIs in developing countries face similar challenges as the developed world, but also have unique circumstances with which to contend. The Task Team on Higher Education and Society (World Bank Task Force on Higher Education and Society, 2000) suggests that developing countries must decide realistically what they can each expect to achieve. They should particularly, perhaps, have a more coordinated view of what meets national interest, while at the same time giving HEIs enough autonomy to operate independently. HEIs should provide more specialist skills-based training, teach students to be flexible and keep their knowledge up-to-date by encouraging life-long learning. These countries should increase the amount of local research, allow for HEI differentiation, but encourage greater cooperation to use scarce resources, encourage more openness and sharing with business and society, and use a mixed funding model. They also suggest a focus on

governance and executive management since it is suggested that this is one of the biggest problems faced by HEIs.

How these factors and features reflect the South African landscape is explored next.

## **2.6 *HEIs in South Africa***

South Africa is not immune to the factors and changes mentioned in Section 2.4.

However, unique events have affected and are affecting education in South Africa.

### **2.6.1 Context**

The major event shaping South Africa has been the demise of Apartheid, the new Government's focus on social redress and economic growth, and an involvement in Africa with the aim of breaking the Eurocentric mindset of the previous years. The role of higher education is to teach, research, and assist in development of the country. The Educational budget has always been high – one of the largest in terms of proportion of the National budget, but differences existed and still exist between rural and urban schools, and also previously between the largely black tertiary institutions (mostly situated in “independent” homelands within the Republic and often called “bush colleges”) and the previously white institutions.

### **2.6.2 History**

The education policies of the Apartheid era were definitive in shaping the educational environment. They led to the creation of Historically Black Universities and Technikons (HBUs), and created a racial divide between these and Historically White Universities and Technikons (HWUs) by prescribing who could attend which institution based on race. This occurred despite vehement, but fruitless, protest from most of the English-language HWUs at the breach of academic freedom.

The HWUs drew their student body from scholars who had passed through the excellent private and “white” government schools. They were largely middle class from relatively prosperous homes. HWUs were based on the British model of universities, and were

arguably internationally competitive, although as stated by Habib and Parekh, their research output was comparatively low (Habib and Parekh, 1999). They were, generally, well administered and orderly although student protest against apartheid caused upheavals at the more liberal of the HWUs.

New HBUs were established in the homelands to give the semblance of equity, and were initially very well resourced with wonderful infrastructure and very well paid (relatively) academics (to ensure that the institutions could attract lecturers). The intake at the HBUs was largely students from inferior schooling systems. This led to a lowering of the standards as set at the HWUs and the students graduating from these institutions were often unemployable at a time when SA was booming economically (but given restrictive labour practices). State interference at HBUs ranged from close interference to minimal interference, especially regarding finances. The provincial governments subsidised selected institutions unstintingly, and when this source of funding dried up in the “new” South Africa, these institutions experienced severe financial difficulties.

For the country, there were other economic disadvantages to this landscape: expensive offerings were duplicated and inflated salaries were paid at many HBUs, causing a drain on government funds. It was a malfunctioning system (Fourie and Fourie, 2001). Some of the academics teaching at these institutions did so through a sense of social justice or were drawn by the excellent resources, but others were under-qualified and demotivated, and attracted to the profession purely by the relatively good salaries (or lack of other employment).

In the 1980s, the population of black students increased, but so too did the student debt at the HBUs. Huge debts were accumulated in most HBUs, as a result of poorer students and student debt protests, as well as inadequate management. The administration was either unable or unwilling to control finances. A state of anarchy reigned at most of the HBUs, with student activism a contributing cause to poor education and management.

As the regime faltered, the HBUs were in serious trouble: financially insolvent, plagued by infighting and tribalism, and producing very weak graduates on the whole (Jansen,

2002). These are problems similar to those experienced in HEIs in developing countries as reported by the Task Force on Higher Education and Society such as faculty often being under-qualified, lacking motivation, and poorly paid (compared to the private sector). Students are poorly taught and poorly prepared for tertiary education, and curricula are underdeveloped (World Bank Task Force on Higher Education and Society, 2000). The new administrators often had little experience in management and some were allegedly corrupt (Jansen, 2002: 158). Poor financial practices existed (Habib and Parekh, 1999).

### **2.6.3 HEIs in post-apartheid South Africa**

The changes occurring globally, discussed earlier, were prevalent in HEIs in South Africa also. In addition, general legislation that was put in place for SA business organisations affected education also. Examples include legislation circumscribing free market activities such as labour regulations, employment equity, and affirmative action. More specifically, the Government embarked on legislation to “restructure the educational landscape” in order to try to equalise the institutions: transformation of HEIs.

#### **2.6.3.1 Transformation and the role of the State**

The term transformation is used globally to denote the changes required by HEIs to survive diminished State funding. In South Africa, the term is loaded with other meanings also. It includes, more or less explicitly: increased access, demographic balance, Africanisation, local relevance, more embracing/transparent governance, greater democracy, and employment equity as core features (Council for Higher Education - CHE- Report, 2000; Department of Education, 2002).

The new government embraced the need for transforming the educational landscape to cope with global changes, but also to “redress the evils of apartheid” by correcting the imbalances that existed. The National Plan for Higher Education in South Africa (NPHESA) stated that the “institutional landscape of Higher Education must be restructured to address the racial fragmentation of the systems, as well as the

administrative, human and financial constraints” (Ntshoe, 2002b: 9). Thus the White Paper 3 of July 1997 stated that the HE system in SA needed to have greater and broader participation, responsiveness to the needs of the society, and cooperative governance (Cloete and Bunting, 2000). The White Paper stressed the following principles: equity and redress, effectiveness and efficiency, public accountability, institutional autonomy, academic freedom, democratisation, development, and quality (Council for Higher Education -CHE- Report, 2000). The NPHESA of 2001 cited five policy goals to guide the process of transformation:

- Increased access
- Equity to redress demographic inequalities
- Ensure diversity to meet national and regional economic needs
- Building research capacity and
- Establishment of new institutions (Paterson, 2004).

A report of the National Department of Education cited five aims: Quality of graduates; Equity in HEIs (access); Diversity (merging of institutions); Research; and Support for HEIs (under which strategies such as annual reporting and language policy somewhat puzzlingly fall) (Department of Education, 2004a).

In brief, the sense was to make HWUs less Eurocentric - more focused on their situation in Africa - and less elitist, to make HBUs more efficient and effective, to eliminate the racial divide and to allow the whole HE system to contribute to national goals.

#### ***2.6.3.1.1 Funding***

Government subsidies are set to shrink in South Africa for HEIs as has happened elsewhere in the world. HBUs would no longer get favourable proportional subsidies. A new more complex funding formula has been created.

The formula suggests that different areas of study would be funded according to a grid of costs of programmes per Full-Time Equivalent (FTE) student (whereas before funding

was allocated for Science and non-Science subjects). The logic of this funding grid is suspect as there appear to be contradictory purposes: funding disciplines that are expensive and unpopular versus funding disciplines that meet the economic needs of the country (an example is the high funding of Art versus that for Computer Science).

Over and above this, however, an institutional adjustment factor would be allocated depending on the proportion of previously disadvantaged students enrolled, the approved size of the institution (it appears to allocate more to smaller institutions), and the approved shape per the funding grid for full-time equivalent (FTE) enrolments which would allow government to encourage the provision of certain programmes that it considers beneficial to the needs of the country. Funding is also earmarked for financial assistance for needy students, research development, foundation programmes, payments on approved loans, approved capital projects, and a catch-all “any other purpose” acceptable to the Ministry.

In 1999/2000, approximately 21% of the national budget was spent on education, 14% of which was spent on higher education, that is 3% of the national budget (Cloete and Bunting, 2000: 61). Despite the very large proportion of the budget allocated to education, the state of education, and specifically HBUs, was in disarray. Further financial (and educational) damage was caused at the HBUs at this time by the fact that good black students flocked to HWUs, diminishing the pool of students at the HBUs, and thereby diminishing government subsidies based on student numbers.

Although the proposed formula is stated not to be based solely on a “manpower planning stance” (Department of Education, 2004b), and the paradox above illustrates this, nevertheless the Verwoerdian era of social engineering is being replaced by another, arguably more benignly intentioned, era of state control.

#### ***2.6.3.1.2 Cost to students***

An ex-University planner states: “there is no doubt in my mind that the cost to consumer is rising much faster than the CPI” and “The state is footing a much smaller proportion of the costs of HE and the customer is making up the balance” (Smout, 2005). Smout



comments on the “A-factor”, by which the state subsidised Universities – an “A-factor was introduced to state subsidies in Higher Education”. This was a percentage/fraction of what the Government could afford to apportion to Universities from the ideal amount that Universities would expect given their size and output. “In 1997, the A factor was 0.97. At its worst in 2001, it was down to 0.50 and is currently around 0.54”.

### ***2.6.3.1.3 Massification***

In line with global trends, greater participation was required in higher education. According to the National Plan for Higher Education in South Africa (NPHESA) as quoted by Ntshoe (2002b), participation in the sector was targeted at an increase of 15% to 20%. There were several motivations for this:

- The view that this would boost the economy
- The need to provide a continuously learning workforce for industry through accommodating life-long learning
- The need to enrol students who would previously have been excluded because of their academic or financial background
- The need to try to recognise working experience of mature learners (Assessment and recognition of prior learning - ARPL) in order to include previously disadvantaged, but older individuals in higher education
- The stated aim of changing the demographic profile of the student population to reflect that of the country.

It was assumed that the numbers enrolling for Higher Education would increase, as has happened elsewhere. The National Council for Higher Education predicted that from 800,000 in 1995, an increase to 1,600,000 would result with the new policies (NCHE, 1996 as quoted in Rodenacker, (1998)). However, despite an initial increase in the rate of participation, the converse of growth has been true (Cloete and Bunting, 2000; Council for Higher Education -CHE- Report, 2000; Gultig, 2000). The pool of students who have passed matric (the school leaving grade), let alone passed with exemption to

enter Universities, is reportedly shrinking (Ntshoe, 2004: 147). The decrease in matriculants could be ascribed to worsening schooling (perhaps due to the hasty imposition of OBE) and poor management, and also to the ravages of AIDS. There has been a decrease in white students nationally (Fourie and Fourie, 2001). The author assumes this is as a result of increasing emigration (Census 2001) as quoted in the Daily Dispatch (Editorial Opinion, 2003). There seem to be contrary views on this. Between 2000, where the enrolled headcount at HEIs was 587,000, to 2003 where the headcount was 718,000, an 11% increase was reported (Department of Education, 2004a) with this increase greater in Universities than Technikons. According to this report, the headcount objective is 20% participation, and the 2003 figure is 18%.

To achieve the increase in numbers was problematic given the dropping rate of (good) matriculants. It was recognised that many prospective students had major financial problems. It was also recognised that the schooling of many students was inferior and that they would need even more support arguably than their counterparts in Europe or elsewhere where the problem of under prepared students has also occurred, but where the initial schooling was not as poor (SAUVCA, 2002).

The attendant problems in attempting to increase student participation are common to developing countries. Access to higher education in sub-Saharan Africa is seventeen times lower than in other developing countries, and access is “five to six times” lower in all developing countries than developed countries (Sadlak, 2000; World Bank Task Force on Higher Education and Society, 2000: 27). Where South Africa as a whole fits on that continuum is not clear, except the rate is higher than that mentioned for sub-Saharan Africa according to a Senior Academic, Rhodes University in 2004<sup>1</sup>. It was stated, however, that enrolment growth should only increase if the resources existed, and the report on student enrolment noted that enrolment “has grown more rapidly than available resources” (HESA, 2005). Indeed, the Minister of Education (Pandor, who

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<sup>1</sup>Abbreviation used in future – see glossary - SAc, RU, 2004

took over from Asmal in 2004) has once again mentioned “capping” in order to match growth with resources for 2006.

A further problem was the unacceptably large drop-out rate of students across the spectrum of higher education (Cloete and Bunting, 2000; Council for Higher Education - CHE- Report, 2000). The graduation rate was averaged at 15% over 2000-2003 which was seen as unacceptably low (Department of Education, 2004a). Increased throughput was one of the previous Minister of Education’s aims (Asmal, 2001).

#### ***2.6.3.1.4 Competition from foreign HEIs***

In line with what was happening internationally and after the end of apartheid, competition from universities outside South Africa mushroomed. In 2000, 43 known foreign universities were operating in South Africa (Bitzer, 2002). Problematic in this regard was the poor quality of courses being franchised and the fraudulent degrees on offer (World Bank Task Force on Higher Education and Society, 2000). In addition, numerous private institutions also existed: 88 were registered in 2000 (Bitzer, 2002), some with very dubious credentials, catching poorer students (financially and academically) desperate for education.

Internally, local HWUs, desperately trying to boost their numbers of black students, set up satellite campuses wherever they judged it profitable. East London, a small city with a population of 1 million (estimated) had Border Technikon, East Cape Technikon, Natal University, Port Elizabeth Technikon, Pretoria Technikon, Potchefstroom University for Higher Christian Education, Rhodes University, Unisa, University of the Free State, and Fort Hare University operating in 2003, where previously only Unisa, Rhodes and Border Technikon had operated. This was counterproductive competition.

Government made attempts to control this proliferation, but ran into resistance from opposition parties on the basis of, for example, free market principles, and has so far not regulated the competition. An exception is in quality assurance of programmes such as the MBA programmes. Some argue whether in this age of on-line learning, it is indeed possible to regulate so effectively. The regulatory framework in Table 2-1 Regulatory

framework (Free Degrees Fly: Economist, 2005) offers substantiation for this position. The same Economist report, however, notes that Bond University has been forced to withdraw from South Africa because of the restrictions placed on foreign Universities, so a measure of State control on competition exists.

#### ***2.6.3.1.5 Quality and throughput***

Quality in education has been an important consideration (Akoojee, 2002; Department of Education, 1997a). Quality is an issue coupled with a concern for throughput (although this may be more cynically seen as a need to cut subsidy for underperforming students because of financial resource problems). The HEQC (Higher Education Quality Committee, a subcommittee of the Council of Higher Education – CHE) has instituted measures to address this. For example, HEIs will have an audit at least every six years, consisting of self-evaluation reports followed by site visits from a selected panel to check on the management of quality of teaching, research and community engagement. (Private institutions are also being audited.) The HEQC also provides guides to good teaching practice, and programme development. The committee is also instituting a “campaign to make students more aware of quality issues” (Singh, 2004).

#### ***2.6.3.1.6 Competition for students***

The standard of matriculants was reportedly dropping (Editorial Opinion, 2003), and indeed the final examination is now counting less because of continuous assessments which are internally based and which are used to “balance” what used to be a single exit national matriculation examinations. HEIs are in the process of establishing their own entrance tests (in conjunction with other HEIs), where previously reliance was placed on the matriculation results (the so-called Swedish–point rating which gave scores to different symbols. For example, an A symbol at Higher Grade was scored at 7, a B symbol at 6 and so on, while Standard Grade grades were valued at 2 points less. These points were added and different degrees and HEIs had different entry level requirements).

Due to government requirements for demographical representation, the competition for “good” black students has increased. Employment equity issues have caused industry and thus HEIs to compete fiercely (and sometimes innovatively) for good black post-graduate students. Interestingly, it is reported that some HWUs have successfully changed their student demographics and a move is apparent in the HWUs to revert to traditional modes of elitism (albeit demographically changed), while the formerly Afrikaans and Black institutions are embracing entrepreneurial modes by offering market related programmes (Gultig, 2000). How mergers will affect this trend, will be interesting.

A new development has been the State’s proposal to create a central admissions office, where students would apply and be allocated to institutions. Institutions have responded negatively to this proposal as it appears to move control further on to the State. Some Universities have traditionally been able to attract excellent students academically and prided themselves on doing so – their competitive advantage. The government has stated that this proposal is an effort at improving efficiency for students who are not informed whether they have been accepted at an institution until too late and then have to scramble to be accepted elsewhere. A final decision has not been made at the time of writing. While this may reduce competition, it will not remove choices of students who will still elect to study at particular institutions.

#### ***2.6.3.1.7 Mergers***

As a solution to the inefficient duplication of offerings, and other problems besetting the educational environment, the Task Force on Higher Education proposed to combine institutions (Council for Higher Education -CHE- Report, 2000). Mergers were to be made without closing institutions, thus not diminishing the number of educational delivery sites. The 36 HEIs that existed in 1999 were to be changed and merged to result in 21 (Gultig, 2000). The CHE report stated that improved efficiency and effectiveness were being sought by merging (Council for Higher Education -CHE- Report, 2000). The main motives appeared to be those of cost saving in administration, cost savings in

streamlining of offerings (Mokoena, 2003), and support for weaker institutions. Small institutions were viewed as financially inefficient because of higher unit costs, and mergers would assist with this. This is arguable as a study by Taylor and Harris (Taylor and Harris, 2002) showed that Rhodes University, a small HEI, was financially very sound. Of the 21 resulting institutions, five institutions involved two campuses, eight involved three campuses, and one involved four campuses in various combinations of incorporation, divestiture and mergers of whole Universities or campuses.

As has already been stated, mergers do not necessarily effect cost savings. Indeed, it is likely that an increase in funding is required for the proposed mergers. A Commonwealth Higher Education Management Services (CHEMS) report notes that expectations of savings are rarely achieved and benefits are academic or strategic (Fielden and Markham, 1997). Similarly Jansen e(Jansen, 2002) describes difficulties of establishing any savings effected by mergers. It was reputedly estimated that the mergers proposed would cost 3 billion rand. Labour law ruled against retrenchments so no staff salary savings would be made, initially at least.

Another criticism of this restructuring was raised by Jansen who wrote that the attempt to redress the inequities of the past by forcing institutions together has been the wrong decision, as it would undermine the ability of the “better” Universities to continue to compete internationally. He wrote that it was a race-based, short sighted, strategy. He believed that a two layer system (research universities and teaching universities) would be more realistic, as was proposed originally by the CHE Task team.

The risk for merger success could be higher in South Africa than the 10% quoted in Section 2.4.4.5 for academic mergers, since institutions with very different cultures have been forced to merge. It is widely recognised that cultural differences between partners in mergers are one of the common causes of failure of mergers. The literature (Gultig, 2000) refers to three types of cultural differences: cross-national, cross-organisational, and cross-functional differences. The mergers of Universities and Technikons match the organisational-culture category. However, Gultig does not mention ethnic differences. He notes that cultural differences lead to typical responses of stereotyping, blaming,

stressing differences, and battles for cultural dominance. Mergers could result in one of the following: cultural pluralism, cultural blending, cultural takeover, or cultural resistance. The author's view is that ideally a new corporate culture should be formed in a merger with commonly accepted organisational values, management styles, and organisational symbols, while acknowledging that this is not a simple task.

Another risk area is in taking on a financially unsound institution. By South African law, no institution can be forced to merge with another that is not financially sound. Most of the HBUs had staggering debts, but the State planned for this by providing "recapitalisation funds" to wipe these debts out. (The speech by the Minister of Education mentioned R200 million and two institutions that had thus far benefited from this (Department of Education Policy Speech).

### **2.6.3.2 Management structures and styles**

#### ***2.6.3.2.1 Accountability***

Greater accountability is being required from South African HEI institutions as has happened internationally.

According to the NPHESA, the funding formula is proposed "to ensure greater accountability and the more efficient use of limited research resources" (Ntshoe, 2002b: 9). Quality Assurance audits are being instituted over the next few years, and are taken seriously by HEIs. In addition, the State requires more reporting on organisational performance.

Regulations have also been created to increase the representation of the HEI Councils. The aim for this appears to be to allow for a larger stakeholder and demographic representation, as well as for greater transparency. Institutional transformation forums were legislated into being to enable HEIs to transform by virtue of the increased participation of non-traditional University members. This has led to greater representation of very diverse interests, but has often resulted in very slow decision-making.

Transparency also implies efficiency of operations and managing of public funding – the State does not want to “bale out” uneconomic HEIs.

#### ***2.6.3.2 Flexibility***

In a fast changing environment, where competition is fierce, responsiveness or flexibility of the organisation is vital for surviving and prospering. HEIs are known for being ponderous. In order to increase flexibility and to respond to market needs, the programme route has been suggested. This encompasses the offering of modules to fit different student needs, as and when the need arises, and is designed to allow greater flexibility of operations. Flexibility in offering modules also encourages a better throughput, so it is claimed, by the fact that students may complete portion of courses, and not “waste” a whole year if a course is failed. Technikons had standard courses, although quality varied, but in theory students could transfer easily between such institutions. The Universities offered largely unique courses, and transfers were not easy, resulting in lower throughput rates as students repeated similar if not identical courses when they moved between Universities. Registering of clearly defined programmes of study made up of modules ~~as~~ according to a Qualification Standard defined by National Qualification Framework would enable better standardisation. This would allow students to transfer more easily between institutions (in theory at least, but not much in practice as, in the author’s opinion, students tend to stay at their first registered institution for a specific degree). However, the time taken to register programmes may in fact limit flexibility of institutions to adapt to local conditions or demand.

The focus on multi-disciplinary and focused programmes was also encouraged with an emphasis on market-driven programmes to transform HE (Ntshoe, 2002a). Programmes implied a change from a traditional structure of departments to multi-disciplinary schools, offering specifically market related degrees such as degrees in Tourism, where members of the schools would offer modules towards that degree. Universities, especially but not only HBUs, had produced graduates who had no marketable skills and were unemployed.



This was a move to make curricula more relevant and to force a re-evaluation of outdated teaching content. There has been a mixed reaction to this, with some HEIs moving slowly along this route, others embracing it enthusiastically, the latter with mixed success, and others retaining their traditional mode of operation or adopting a dual approach. One study described a Humanities Faculty that changed their operation to an undergraduate school with disappointing results and the changes were not easy to implement (Gillard, 1998). Indeed, some HEIs are reverting to discipline-based structures and offerings. However, it is too early to predict the merit of this course of action.

#### ***2.6.3.2.3 Students as customers***

Students in South Africa are perhaps less demanding than their European or North American counterparts. Students from historically black schools especially are used to one-way conversations with teachers where they are meant to be silent in class and soak up the teaching. However, students from middle-class backgrounds expect facilities such as Internet connectivity comparable to that available to their international peers. They expect good administrative services and are challenging bad teaching practices. Some older academics hold the view that “the quality of students has gone down and that they are less focused on their learning. The more students can take control over their own learning, the more they can be treated as ‘customers’”. This view was stated by a senior academic at Rhodes University in 2004<sup>2</sup>.

Students from poorer backgrounds continue to have problems with payment of fees, despite extra State funding. Their demands are generally more focused on debt relief than quality issues. The idea of a customer-centric service to students is arguably not fully embraced by HEI staff, especially at HBUs.

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<sup>2</sup> Henceforth referenced as ‘SAc’ to denote position, followed by institution e.g. RU, and then the date e.g. 2004 thus (SAc, RU, 2004)– see Glossary

### **2.6.3.3 Core operations**

#### ***2.6.3.3.1 Massification and diversity – teaching implications***

Although massification has not occurred on the same scale as reported internationally, some faculties (Commerce particularly) have witnessed growth where large class sizes now predominate. In some of the HBUs, ratios higher than 1: 60 are reported as the norm at all levels.

The challenges occasioned by diversity of the student body would be similar internationally, except that arguably the student body is more diverse, given the broad spectrum differences in the educational background of the students. This adds an extra dimension to teaching. It has been postulated that the more under- prepared the students are, the more the lecturer needs to take responsibility for their learning. This is an uncomfortable thought. The use of IS/ICT to allow for different learning styles (eLearning) is at present a very “hot” topic, but the push for web-based learning does not take into account the fact that a large proportion of students do not have access to the Internet except at their place of study (Goldstuck Report).

HEIs are more multilingual than before, and in the traditionally Afrikaans-speaking Universities, classes are now repeated in English. The use of other indigenous languages is being debated. This double teaching is an extra burden on academics.

#### ***2.6.3.3.2 Research***

Locally relevant and practical research is being encouraged through directed funding such as the NRF "Scarce Skills" funding. This has implications for funding of pure research, but is in line with what has been touted elsewhere, especially for developing countries (World Bank Task Force on Higher Education and Society, 2000). It is not clear as yet how successful this change will be.

## **2.6.4 South African specifics**

### **2.6.4.1 Employment Equity**

The South African Government has introduced legislation regarding employment equity in all organisations including HEIs (1998), in order to redress the imbalances of the past. The purpose of the Act “is to achieve equity in the workplace, by .... promoting equal opportunity ... through the elimination of unfair discrimination” and ” implementing affirmative action..” (as) redress for designated groups (“black people, women or people with disabilities”) with the purpose of ensuring “equitable representation” at all levels of the workforce. Employers of over 150 employees, have to report annually and submit reports on compliance with the Act (Summary of the Employment Equity Act), while smaller organisations do the same over a longer period.

Black academics are in short supply, largely because black graduates are being offered princely salaries by business in order to address their own equity problems (Gultig, 2000). Despite the greater transparency and involvement enforced, black academics still feel marginalised in decision-making at HWUs (pilot survey, Appendix A). The reverse may be true for white academics at HBUs.

In addition, although not directly related, academic salaries are less in real terms than those of their international peers (Cloete and Bunting, 2000). Attracting top academics is very difficult and the brain drain continues with the attractive salaries elsewhere, either in industry or academia abroad.

### **2.6.4.2 Quality**

Although quality is mentioned as an “important consideration” by the national Education Department (Akoojee, 2002 pp. 4), the aim of improving the throughput rate and increasing access to poorer prepared students implies a contradiction, not necessarily in quality of teaching, but in output measures benchmarked internationally. Managing the balance is a superhuman task for academics. The support to maintain or improve quality

is not clearly spelt out. Vale notes this as a crucial issue for academics and South Africa (Vale, 2003).

The Institutional Quality audits that are being carried out on institutions and the National Qualification Framework are attempts to impose a set of standards on all education that is offered. This may have the effect of cutting out the dubious credits on offer, but may end up ensuring only the minimally acceptable level of quality.

### **2.6.4.3 Africanisation**

A critique of the traditional curricula at HEIs has been that the offerings are largely euro-centric and have very little relevance to South Africa. The removal of Latin as a core subject for Law has been a small response to this critique. Furthermore, there is a move to demand courses in the students' home language. At present, tuition is offered in English and Afrikaans only. Universities are thus grappling with moving away from euro-centrism in the courses offered. For example, English literature is increasingly using writings from African writers. Other examples are a focus on development studies, and indigenous knowledge and culture. Public administration is another example, as there is a huge need to uplift the skills in the public sector, and HEIs are responding to that need by improving these programmes.

### **2.6.5 Change factors for HEIs in South Africa – in summary**

South African HEIs are affected by global factors affecting all HEIs as well as by unique South African factors. They are adapting to these factors by changing some aspects of their operations.

- Globalisation and competition has caused increased competition for students in SA HEIs through the increased entry of foreign universities. Further and increasing competition has been caused by the need to be demographically representative and therefore there is a scramble for the best black students. In addition, industry is competing for black staff, and good students are attracted to industry rather than academic or postgraduate work.

- State intervention is high while subsidies are decreasing. There is thus a need for and competition for other funding, as elsewhere. However, the HEI context in SA is arguably more State controlled than that of many other nations in developed countries. This may limit their ability to offer courses that are not according to the National Framework.
- Massification has not occurred on as large a scale as internationally, but the problems of large classes occur in the growing disciplines like Commerce and some Humanities courses, such as Psychology.
- Multiculturalism is a pronounced issue for HEIs in SA, exacerbated by the mergers and incorporations that have taken place.
- Public accountability and relevance is an issue also manifested in SA, and the response to this need is exemplified by wider representation on Council, and the adoption of interdisciplinary programmes that would arguable make graduates more useful in the economy.
- Flexibility is necessary for SA HEIs to counteract competition, and may be more difficult to achieve because of State control.
- The use of IS/ICT in eLearning is being pursued in HEIs in SA also, but bandwidth speeds are a problem as are the real term costs of imported technology (as will be noted later).
- Management styles and structure with the mergers of Universities and Technikons have posed challenges of structure. Like HEIs internationally, the burden of administration has increased, with a growth in technical staff, and more management or administration is being done by academic leaders. The structures have also changed with programme-based schools being formed in some cases, causing an uneasy blend between old and new styles.

## 2.6.6 Paradoxes and problems

That a number of the goals above may be contradictory has been pointed out. For example: goals of redress and equity may contradict goals of meeting needs for quality, efficiency and effectiveness in teaching (Gultig, 2000; Ntshoe, 2002a; Ntshoe, 2004). The aims of the Educational policies have resulted in the following paradoxes and problems:

- Greater government interference, but decreasing support.
- Quality of teaching and research is called for, but greater access to under-prepared students and a focus on throughput puts this into jeopardy without added resources.
- Pressure for employment equity, but not the wherewithal to counter the tide of promising academics being attracted into industry.
- HEIs were to assist in attaining urban renewal, rural development, expansion of markets and building of intellectual leadership ("Higher Education at threshold says Asmal", 2002). These are all good aims, but in all but the latter case, not the core business of HEIs (in the author's opinion).
- The Government's plan for restructuring of HEIs, as Ntshoe (2002b) in the title of the article notes, is either "a programme for equity and redress or globalised competition and managerialism".

Sadlak (2000) underlines the problems mentioned above for Universities as a whole by arguing that HEIs will decline if they:

- Submit to ideological or economic interests of the state, politics or industry;
- Have an excessive preoccupation with current local issues or provincialism;
- Disregard the continual search for excellence in teaching and research;
- Make use of "academic freedom", not to safeguard the pursuit of truth and democratic governance, but to escape public accountability.

Jansen (2002: 166) somewhat gloomily writes that “in any merger, data is the first victim”. Similarly, Clark states rather alarmingly, “universities have entered an age of turmoil for which no end is in sight” and “demands on universities outrun their capacity to respond” (Clark, 1998: 129).

## **2.7 Conclusion**

University management has an increasingly difficult task, and more so in South Africa. Government has rising expectations “that universities should be able to do more with less” (Powell, Harloe and Goldsmith, 2001: 45). It is argued that in South Africa turbulence and demands or challenges are greater than most other countries, especially in the developed world, at present. This is supported by the view of Woods, in comparing the South African and North American educational landscape, with the latter characterised by far more “tranquillity and stability” (Woods, 2003). The present group of students is more diverse in culture, background, age, experience and abilities than ever before. Clark states that university leaders suffer a “demand-overload” resulting from having to respond to multiple transformation forces, being required to exhibit more participative and transparent governance, adapt to new funding, qualifications and quality demands, a new legislation, and new reporting requirements (Clark, 1998: 131).

State involvement is such that academic freedom is a fast diminishing and perhaps no longer affordable myth in South Africa especially: who teaches is guided by demographic requirements and redress, whom to teach is equally determined by demographics and redress, and the State through the National Qualification Framework determines to a large extent what can be taught or what degrees can be awarded. This is accompanied by reduced funding and greater requirements for accountability reporting. This is explicable since South Africa has recently emerged from a difficult environment, but it is nonetheless a paradoxical situation.

On a more positive note, there IS greater participation in Higher Education and demographic representation is becoming a reality.

HEIs have to choose a position regarding these demands and challenges, as also on the industry-university partnership and social development requirements.

The next chapter examines management techniques and principles, and IS/ICT management and usage in general to seek answers to higher educational management and leadership challenges.



## **Chapter 3 Information Technology in a changing environment**

### **3.1 Abstract**

This chapter proposes that the support of IS/ICT for organisations in a state of change is seen to be primarily by alignment of the IS/ICT strategic goals and the organisational goals. Such alignment is achieved by providing leadership in using technology innovatively, by supporting flexible organisational structures through the provision of information, and by enabling knowledge and communication management that can in turn support “softer” issues such as the formation of a coherent organisational culture and institutional memory.

### **3.2 Introduction**

IS/ICT has the potential to alter the way organisations operate, and to support organisations that are striving to change to meet new global challenges. Management techniques have changed through the years, as has the use of IS/ICT in organisations. The changes in technology have been vast and fast, and organisations have not always grasped all the possibilities enabled by technology. Disappointment with IS/ICT investments has been reported, and the reasons mentioned are that the IS/ICT strategy has not supported the business strategies and objectives, let alone enabling new competitive strategies and transformation of organisations (in the broadest sense) (Carr, 2003; Goldstein, Katz and Olson, 2003; Kirwin and Smith, 2005; Marchand, Kettinger and Rollins, 2000; Melymuka).

This chapter examines management trends and techniques, IS/ICT trends, and the continual interplay between these. It addresses the second sub-problem: “What management techniques are used to enable organisations to survive and flourish in the context of change and how can IS/ICT support organisations in this context of change?”

by examining strategic management processes and techniques in general and then specifically IS/ICT (strategic) management for organisations in a changing environment.

The chapter continues by discussing IS/ICT trends and support for organisations. It expands on examining the role of IS/ICT within the context of change, and then explores specific South African change issues and IS/ICT support.

The next chapter focuses the discussion of these issues as applied to HEIs with specific reference to South Africa.

### **3.3 *Organisations in a changing global environment***

The relatively new demands posed by the changing global environment have changed the focus of management theory and practice. One of the features of this environment is the often mentioned fast rate of change of the competitive environment, which is ascribed to the fast rate of change of technology intertwined with globalisation.

A special case of change is mentioned specifically, as it has a bearing on later chapters, and this is the merging of institutions. Mergers cause major change, especially to the merged institutions. Business mergers were common in the 1970s, and Jensen (in Andrade and Stafford, 2004) proposes that mergers post mid-1970s were a result of fundamental shocks caused by industry-wide forces. Gorton, Kahl and Rosen (2005) suggest that mergers come in waves and state that the 1990s had the greatest wave of mergers ever in the USA. They agree with Andrade and Stafford that mergers concentrated in industries experiencing a regulatory or technological shift. Mergers can be vertical, horizontal, or conglomerate (Kitching, 1967). Horizontal mergers are of organisations of the same type, with similar customers and products. This typifies mergers occurring among educational institutions. Vertical mergers imply merging of different, but complementary, products with different customers, for example, companies in the supply chain, while conglomerates would be mergers of different types and sometimes unrelated organisations. Horizontal mergers are said to be the least risky

(Kitching, 1967). Paterson states that there can be three types of mergers: weak, strong and full absorption (Paterson, 2004). He describes a weak merger where partners retain their identity; a strong merger where partners retain limited independence while strategic interdependence is high; and full absorption where the goal is to attain a unitary institutional identity. The difficulty level of the mergers rises as the level of independence of partners decreases, with the last being extremely complex.

While it is accepted that organisations are pressurised to adapt to changing circumstances, the nature of the changes required depends on the context. Organisations wishing to succeed, thrive or merely survive have to accommodate and plan for this. The accepted wisdom is that companies that are adaptable are more likely to survive and succeed (Kopanaki, Smithson, Kanellis and Markatos, 2000). Kelly (2006: 4) names features of a responsive business which include being externally oriented, flexible and nimble, visionary but open to corrective feedback, and balancing economic and moral wisdom while stating that “no-one has ever seen a truly ‘adaptive organisation’ in the wild”.

Although not necessarily formally done, most organisations practice a form of strategic planning and management in order to lessen uncertainty. The purpose of strategic management is for an organisation to achieve its objectives within its chosen environment (Roets, 2003) and some of those objectives are set to cope with a changing environment or to exploit new opportunities.

Originally, strategic planning had a long term focus and was set for three to five year cycles. Some writers argue that in times of extreme change, organisations have no time to have long term and strategic plans. However, in practice most medium to large organisations have strategic plans in place. They practice the espoused methods of strategic management and react to change by decreasing the planning cycle and decreasing the planning horizon. In practice, in these changing times, strategic objectives are set, but revisited constantly on an annual or even biannual cycle (Savage, 2003).

Strategic planning thus includes elements that allow organisations to cope with the changing environment and to transform either themselves or the environment in which they operate. In a context of change, it is necessary to be flexible, however nebulous the definition of flexible: “flexibility is an essential characteristic of successful enterprises in ...rapidly changing business environment” (Koornhof, 2001: 21). Once defined, their strategies need to be amended as the context changes. The strategies should allow the organisation to transform its products, services, customers, and possibly its own structure to cope with changing partners, customers, competitors and national or global changing environments. The term transformation is widely used to denote changes of magnitude. The term is defined as being a synonym for metamorphosis and can be seen to mean a dramatic change in organisational structures, processes, culture or environment.

Flexibility and agility are terms that have gained popularity in connection with the need to adapt to the fast changing environment. Kopanaki and Smithson (2003) state that adaptability, efficiency, responsiveness and versatility provide indicators of flexibility. They, in line with Robey and Boudreau (1999), contend that influences such as organisational, political, structural and behavioural issues affect flexibility.

Kopanaki and Smithson (2003) divide flexibility into:

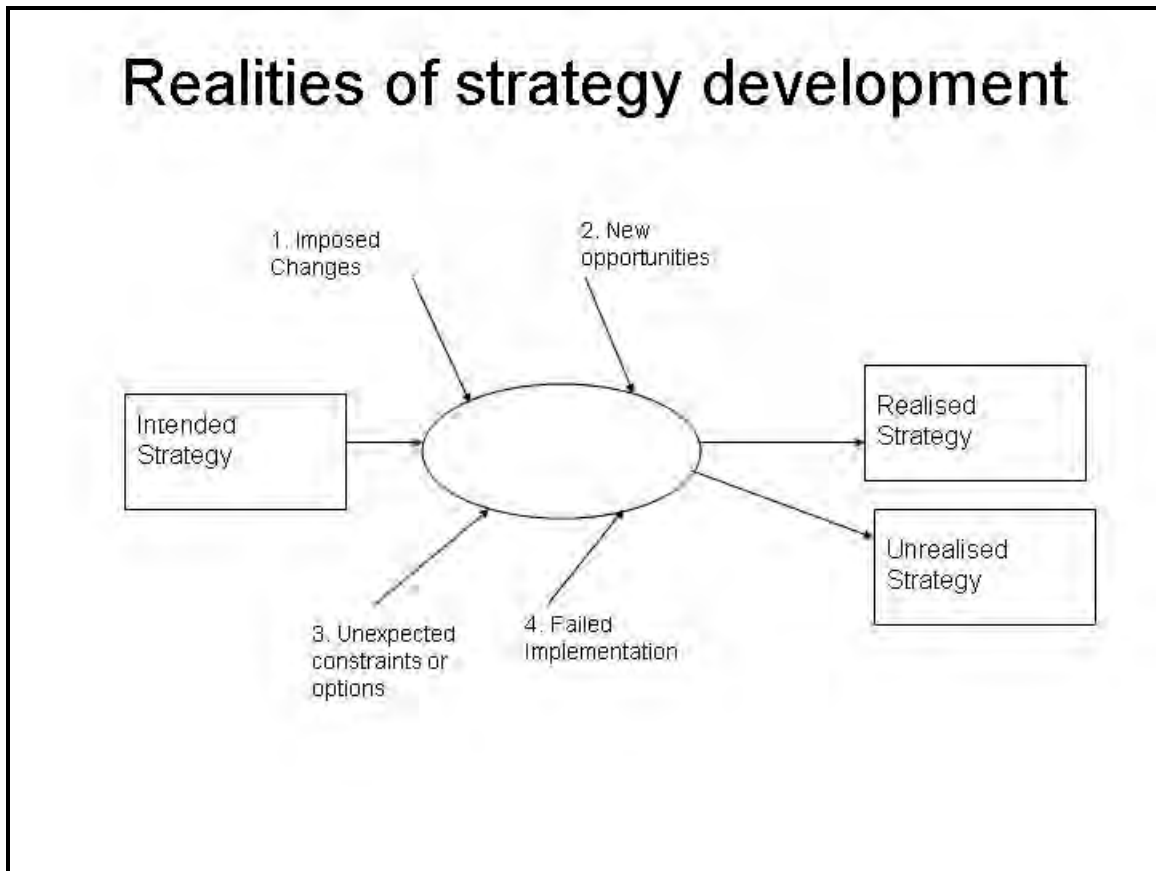
- Strategic flexibility, for example, creating new products for new market conditions;
- Operational flexibility, for example, JIT manufacturing, efficient consumer response;
- Structural flexibility, for example, expansion of business networks or new operations in conjunction with partners.

Two main factors thus emerge: Strategic management is vital to cope with environmental uncertainties and to allow scope for flexibility. The strategies that result may well cause organisational changes in that organisations may be structured more flexibly for flexible products and services. Organisations may also have strategies in place to change the environment, in other words, leading change through innovation on a

macro or micro level (introducing a radically new form of fuel, or introducing supply-chain management are examples of each).

### **3.4 Strategic management**

Strategic management as advocated by the rationalist school of management follows the positivist tradition where the organisation is seen as a rational goal-seeking organisation (Mintzberg and Lampel, 1999). The rational approach has developed techniques for strategic management that are widely practised. It encompasses a stress on flexibility in a changing environment. Critics state that strategic management does not approximate reality (or practice) and writers criticise the overly deterministic and static nature of strategic planning following the rational model. Figure 3-1 depicts what some researchers accept as a better model (Johnson and Scholes in Ward and Peppard, 2002). In the model, the planning process has “emergent” results, intended versus actual, in the strategy process.



**Figure 3-1 Emergent Strategy - Johnson and Scholes (in Ward & Peppard, 2002)**

Mintzberg and Lampel (1999) support the idea of emerging and changing strategies, stating that the strategic process can change depending on the situation – the “configuration school” in which organisations may change their stance depending on the context. Although strategic planning usually takes place, strategies may change because of emergent needs, and the goals reached are not always the goals that were planned for. The view is that the rational school’s approach approximates reality.

### **3.5 Change**

Strategic management can and should encompass plans for dealing with or initiating change. Various management techniques exist that assist in strategic management,

especially in a stable environment. Questions have been raised about how pertinent these are in an unstable environment. Strategic management should also include provision for emergent strategies that can assist in instable environments. However, if the structures and processes are not conducive to change, emergent strategies may be lost. A learning, decentralised organisation is likely to be able to respond better to change (and help evolve emerging strategies). Similarly, a networked structure is touted as enabling agility. This is a more complex structure to the machine structure of Mintzberg (1979), and whereas the latter exemplifies a more or less tightly coupled stable system, the networked structure exemplifies more closely a complex dynamic structure or system. Organisational culture is also a factor in being responsive. In service organisations, a customer focus allows for quick response to needs and possible market gaps. A customer-centric culture would be of benefit to such organisations.

### **3.6 *Challenges of management in South Africa***

#### **3.6.1 General**

Section 3.4 examined strategic management of organisations with a focus on adaptation and flexibility. This section discusses management challenges uniquely South African. Management of organisations is similar across the globe. However, the features unique to a country may have an effect on the strategic management of an organisation – the context within which it operates and for multinational organisations, the context of sub-units, affect their operations. One contextual factor that has a decided effect is that of the State. Government intervention remains a dominant factor.

Savage (2003) differentiates between larger and smaller organisations. He holds that the growth of all large organisations is strongly influenced by the political, economic and social environment in which they operate because of their proportionately large share of the production and market of the country. In South Africa, specific factors such as the relatively small, albeit developing, economy and exchange controls (a major factor in foreign fixed investment decisions) affect the perception of country risk. As

compensation, investors in fixed investment require an additional 2% additional return. This environment is less critical for smaller business organisations that can operate in niche markets.

Today, distorting laws are being implemented to combat the effects of previously distorting laws, mainly on racial (transformation) issues. The specific laws at play in South Africa have been mentioned in the previous chapter (see Section 2.4.3 in the context of the changing role of the State).

Laws were passed by the new SA Government in order to transform the economy of the country in an attempt to redress imbalances of the past that had excluded Blacks from economic activities. The following laws are included as part of the drive to foster black economic empowerment:

“The Promotion of Equality and Prevention of Unfair Discrimination Act; Extension of Security of Tenure Act; Restitution of Land Rights Act; Employment Equity Act; National Empowerment Fund Act; Competition Act; Telecommunications Act; Preferential Procurement Policy Framework Act; and, the Minerals and Petroleum Development Act”. (Department of Trade and Industry, 2003)

Many of these laws have an effect on the human resource practices of organisations. The very restrictive labour laws have redressed some of the inequities of the past, but have also added levels of complexity for managers, and limited flexibility. The lack of capacity of government at local and provincial levels can also produce bureaucratic delays which can reduce efficiency of operations for business organisations.

The Preferential Procurement Act of 2000 changes the nature of competition for Government business:

“...recognised that government, as the largest buyer of goods and services in the economy, had the responsibility to leverage this purchasing power in support of its economic policy objectives of broad-based black economic empowerment, small enterprise development, and labour-intensive construction. Mechanisms were introduced to give effect to a preferential procurement policy:

The tendering process was made more accessible to black people,

Tenders were ‘unbundled’ into smaller tenders to allow smaller enterprises to tender for work,



A point system was introduced to award tenders on the basis of the combination of price and preference for targeted groups” (ibid).

The abundance of legislation in industry affects all businesses, but is often cited as a specific reason why entrepreneurship and small enterprises have difficulty in growing, despite having as an aim, for example, the fostering of entrepreneurship through easier access to financing for previously disadvantaged groups. The overheads become excessive in relation to the size of the business.

Social responsibility issues are taken seriously by most organisations (even if not enforced by the State). There is a balance to be found between the no-longer-acceptable “naked capitalism” and a form of socialism. Given the recent past, racism is still seen, sometimes incorrectly, as the source of problems and needs to be managed in the workforce. Political sensitivity is required.

South Africans previously disadvantaged by the Apartheid regime have vast expectations that their lives will change for the better. “For the majority this can occur, but this ... is not easily attainable” (Savage, 2003). Savage (2003) continues by stating that if the economy continues to accelerate from the existing base, as has already happened, an inhibiting factor for all organisations could well be a lack of skilled human resources. This lack is exacerbated by the effects of AIDS on the population. Furthermore, the diversity of employees in organisations is a management challenge. This is, of course, not all negative (apart from the AIDS pandemic) – merely different - and brings different problems and advantages, which have the possibility of developing more rounded managers. It is also not unique to South Africa, but given South Africa’s past, perhaps more starkly immediate.

All these issues are part of the context that has to be dealt with through strategic management.

### **3.7 *The role of IS/ICT in supporting organisations in a changing context***

#### **3.7.1 Introduction**

As discussed, organisations are operating in a changing environment. Strategic management and flexible, adaptive structures, for example, network structures, and fostering of learning organisations are said to help cope and achieve success. South Africa has specific transformational needs and drivers of concern for transformation.

This section examines the role of IS/ICT specifically in supporting management in a context of change. A particular focus is on the need for, and means of, aligning IS/ICT strategy with business strategy and thereby support for transformational strategies by enabling change. Factors for the successful functioning of IS/ICT with regard to fostering flexibility are discussed. The section concludes with a short review of the specific aspects of IS/ICT in South Africa that might impact on the above.

#### **3.7.2 History of IS/ICT development**

The concerns of IS/ICT management at times lag and at other times lead organisational management concerns. The role of IS/ICT in organisations has been through different phases. The first was in the use of technology to improve efficiency of transaction processing (DP era); the second was the MIS era where the importance of information to the whole organisation was stressed; the third phase was the use of IS/ICT to provide a unique contribution to the competitive position of the organisation. Earl (in Boland and Hirschheim, 1987) noted that IT should be used strategically to gain competitive advantage, to improve productivity and performance, to enable new ways of managing and structuring and for developing new business. While this reflects the time at which it was written, it nevertheless still holds albeit with different emphases.

At the same time, IS/ICT value for organisations has been an issue since the 1980s where organisations have questioned the large amounts of money spent on IS/ICT. The excesses of an overly technological solution to management practice has more recently

led to a re-examination of IS/ICT value. Byrd and Turner (2001) complain that IT is still seen as a cost centre and not a “value centre” in most organisations. A thought provoking article by Carr argues that as IT's power and presence has grown, its strategic relevance has decreased and that IT should be seen as “a cost of doing business” (Carr, 2003: 42). One of the reasons for the disappointment with the perceived value of IS/ICT has been ascribed to the fact that IS/ICT has not supported the strategic goals of the organisation. The term misalignment has been coined.

Despite these doubts, organisations are still spending vast amounts on IS/ICT. The expenditure on IT in the United States was 5% of capital expenditure on average in 1965, increasing to 30% by mid 1990s, and to 50% by 2000 (Freedman, 2003). This decreased somewhat at the start of the century after the Y2K and Dot Bomb stage, but shows signs of growth again. The fact that Information Technology cost is a large capital expenditure for organisations implies the need for careful and strategic management of this function. The principles of the rational school of management can be applied to support units such as IT also, and the same management techniques from the rationalist school may be usefully applied.

The added complexity is that IS/ICT strategic management (as any support unit) has two facets: Strategic planning for the IT function or Strategic Information Systems Planning (combined as Strategic IS/ICT Planning and Management or SIPM in this document), and strategic support of organisational goals. It is accepted that it is a complex task: “IS must accommodate rapid technological change, its projects are often very high cost, and increasingly competitive well-being depends on IS delivering those systems that enable the business to function effectively” (Robson, 1994: 81). The two strands of strategic management are obviously dependent on each other and are (or should be) intertwined.

The fact that technology is constantly changing adds to the difficulties of strategic management.

### 3.8 IS/ICT strategic planning and management

In theory, IS/ICT strategic management follows the same steps as organisational strategic management.

#### 3.8.1 Components

IS/ICT strategic management is often split up into IT strategies and IS strategies. Ragu-Nathan, Ragu-Nathan, Tu and Shi (2001) refer to Earl's 1989 model (Figure 3-2) which identifies different components to be focused on in strategic IS planning:

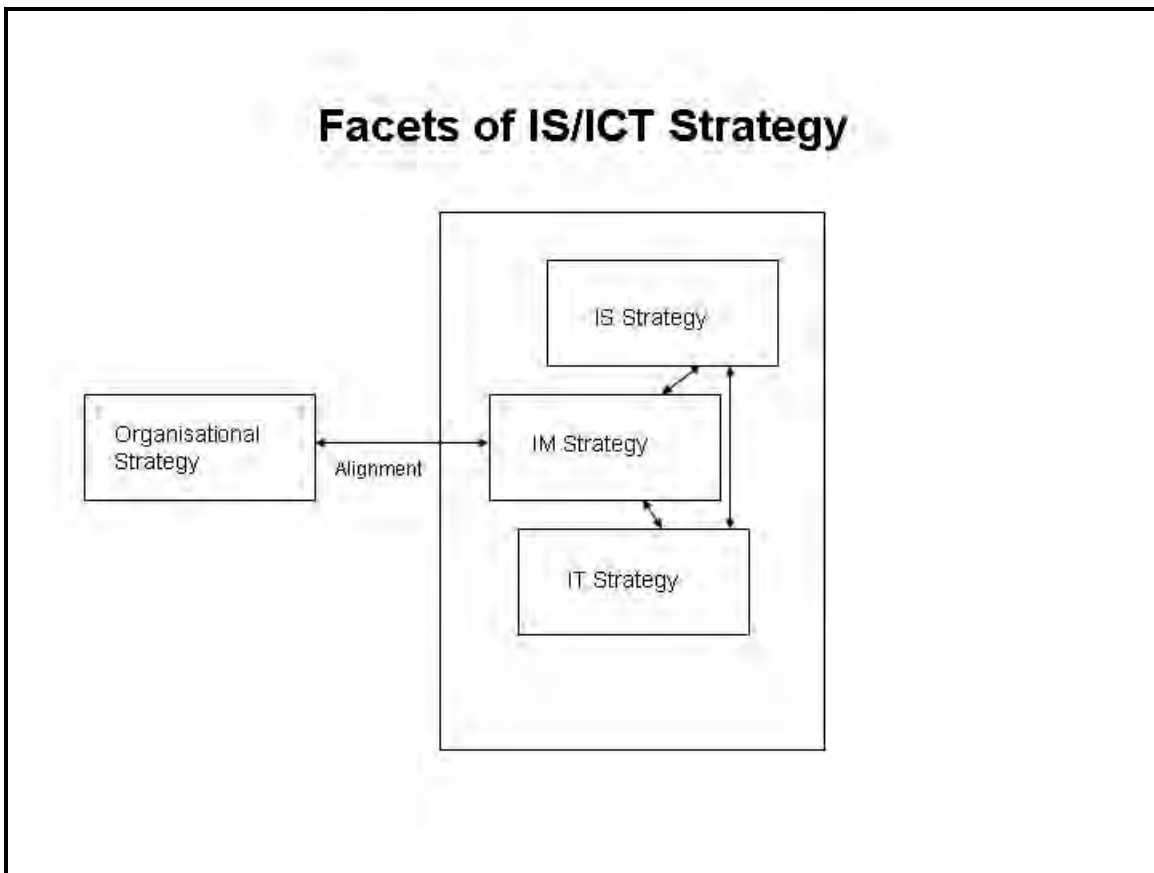


Figure 3-2 Earl's 1989 Model of SISP (in Ragu-Nathan *et al*, 2001)

According to this model, IS strategy concerns the applications that need to support the organisation, IT strategy concerns the infrastructural strategies, and IM (Information Management) strategies concern the management of the total resource at a managerial level.

Galliers (in Allen, 1995) differentiates between an Information Strategy (what information is required); Information Management strategy (how services are organised, what policies exist for issues on access to information, etc); Information Technology strategy (nuts and bolts of IT infrastructure); and Change Management strategies.

Earl's model is expanded by the author in Figure 3-3 in order to highlight other areas that require planning under the IS/ICT function arising from the need for flexibility, and to indicate strategic management of these areas and not just the planning process.

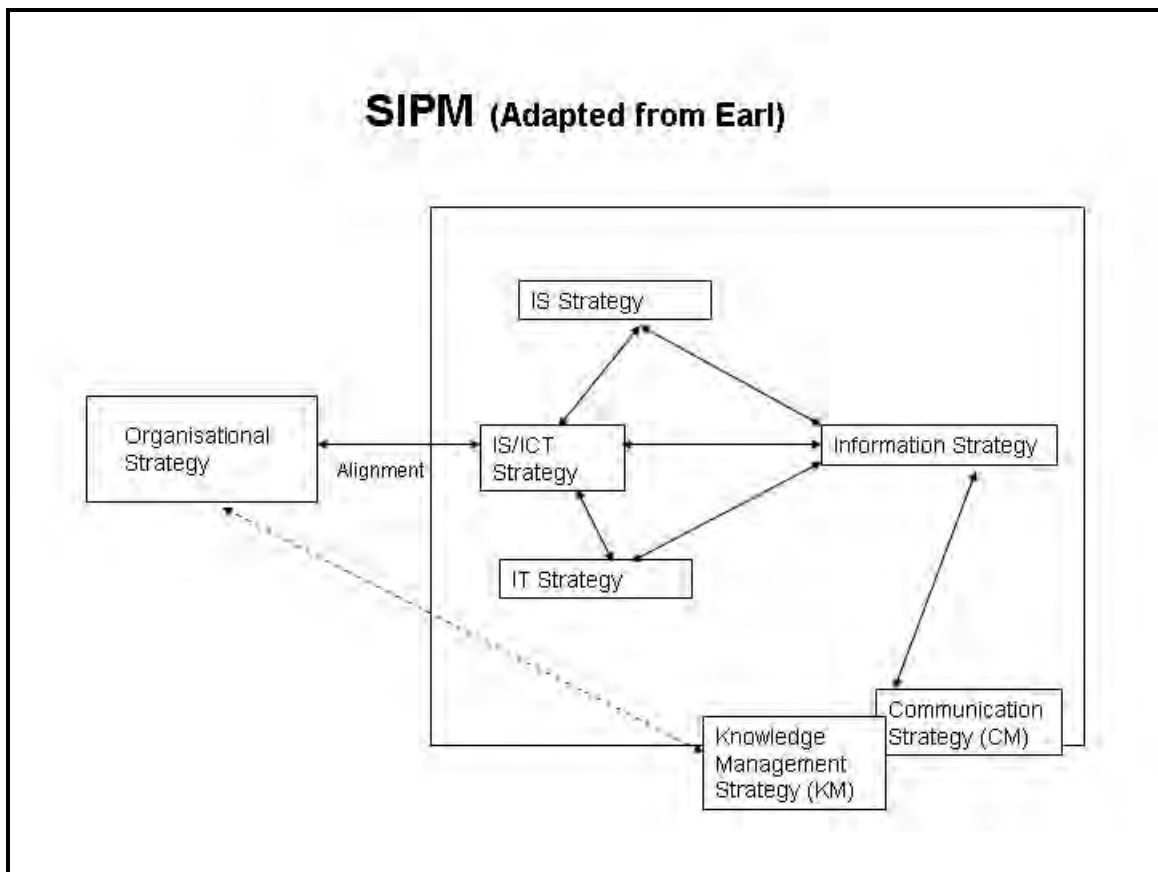


Figure 3-3 SIPM – Roets' adaptation of Earl's 1989 model

The diagram is expanded by depicting three other components of IS/ICT that ideally should be embraced by IM. The additions are Information, Knowledge and Communication strategic management components.

- The Information Strategy component encompasses management to maintain the electronic data in the organisation, especially with respect to transactional data. It includes management of policies of use, ownership and access. It also manages the information quality of the organisation. This component should mesh closely with the IS strategy, but whereas the former will take a process-centric view, the latter takes a data- and information-centric view of the organisation.
- Knowledge Management (KM) deals with knowledge that is both tacit and explicit, and either codified or non-codified and as such may encompass social processes. Knowledge Management supports the fostering of a learning organisation, through the creation, storage, use and dissemination of information. A diagram, indicating the knowledge loop is depicted in Figure 3-4:

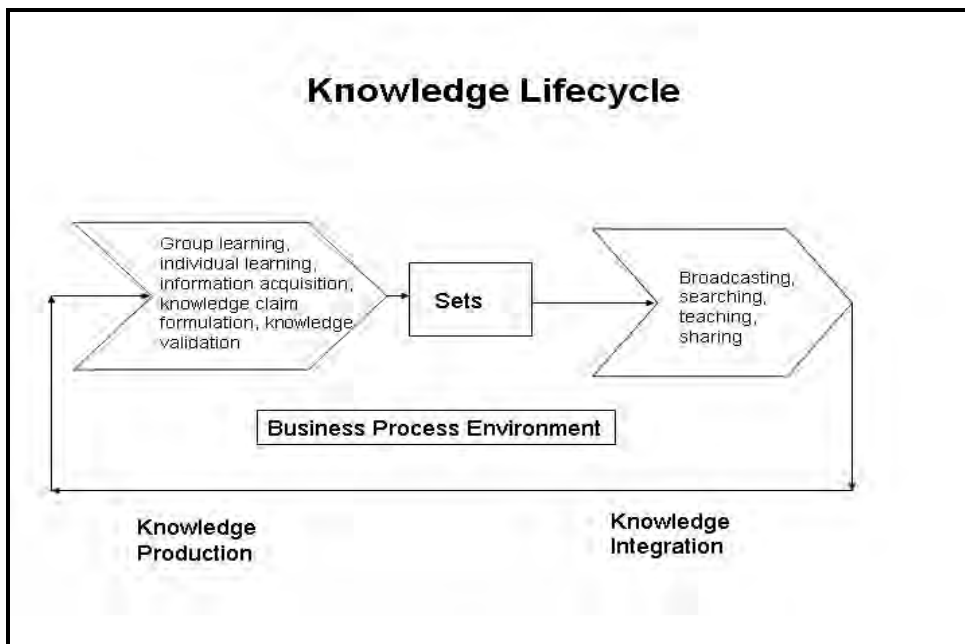


Figure 3-4 Knowledge Lifecycle - adapted from McElroy (2002)

- Knowledge Management Strategy is the management of the knowledge loop at strategic level and is shown as overlapping the outline of IS/ICT strategic management in Figure 3-3, as it is strictly speaking not an IS/ICT Strategy alone. The area that concerns this report is the IS/ICT enablement of KM.
- Communication Management (CM) is separated from KM. It concerns the facet of KM that deals with dissemination of information in the wider sense of communication within and beyond the organisation. However, this report deals only with IS/ICT enabled communications and the support for tacit KM. It is linked closely with information management in order to provide access to management information, while it has a wider role in enabling communication using unstructured information and non-operational information that might otherwise be difficult.

Figure 3-5 shows the linkage between KM and CM:

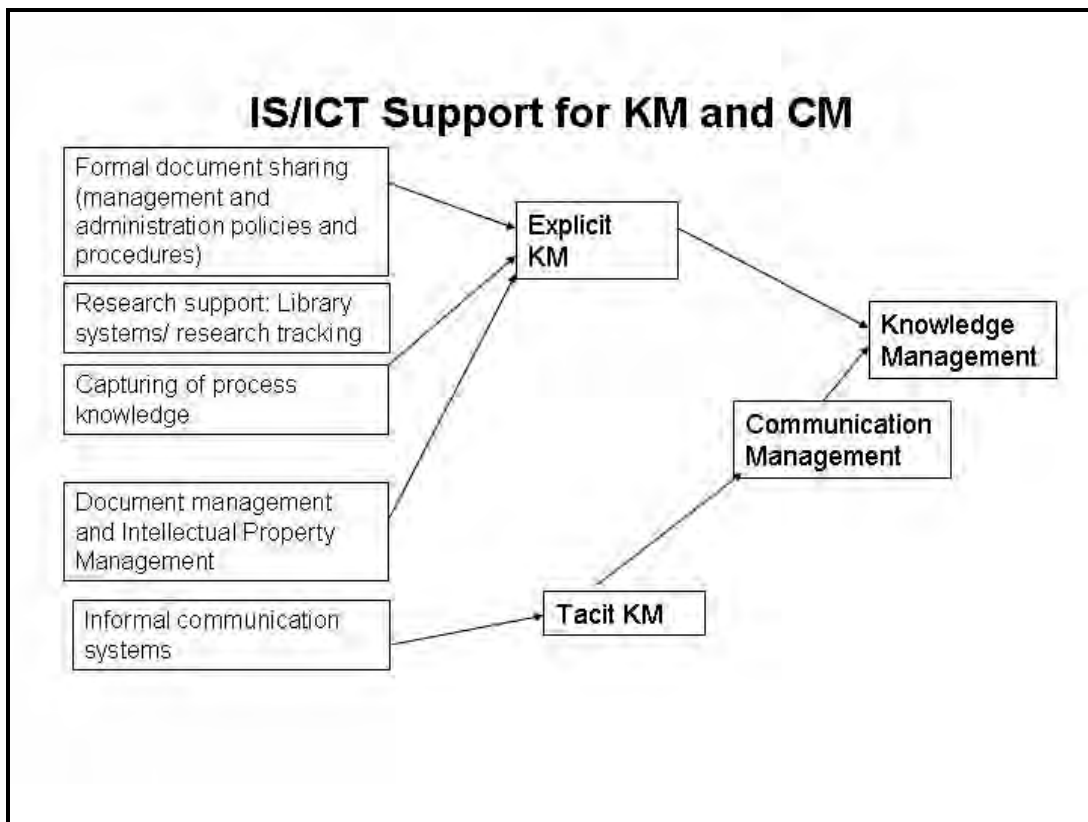


Figure 3-5 IS/ICT enabled KM and CM

The value of tacit/informal KM is less easily quantifiable and less easily supported than explicit KM.

The author suggests that IS/ICT strategic planning and management should encompass all the elements depicted in Figure 3-3 as a prerequisite for completeness and success. The acronym SIPM to indicate the strategic planning and management of all the components of strategic information management is used through the rest of the document.

While neither of the above models (Figure 3-4 and Figure 3-5) highlights the linkage with business strategies, this is modelled in Figure 3-3. According to McNurlin and Sprague (2004), the following diagram (Figure 3-6) depicts traditional strategising for IS/ICT, and shows business linkage explicitly:

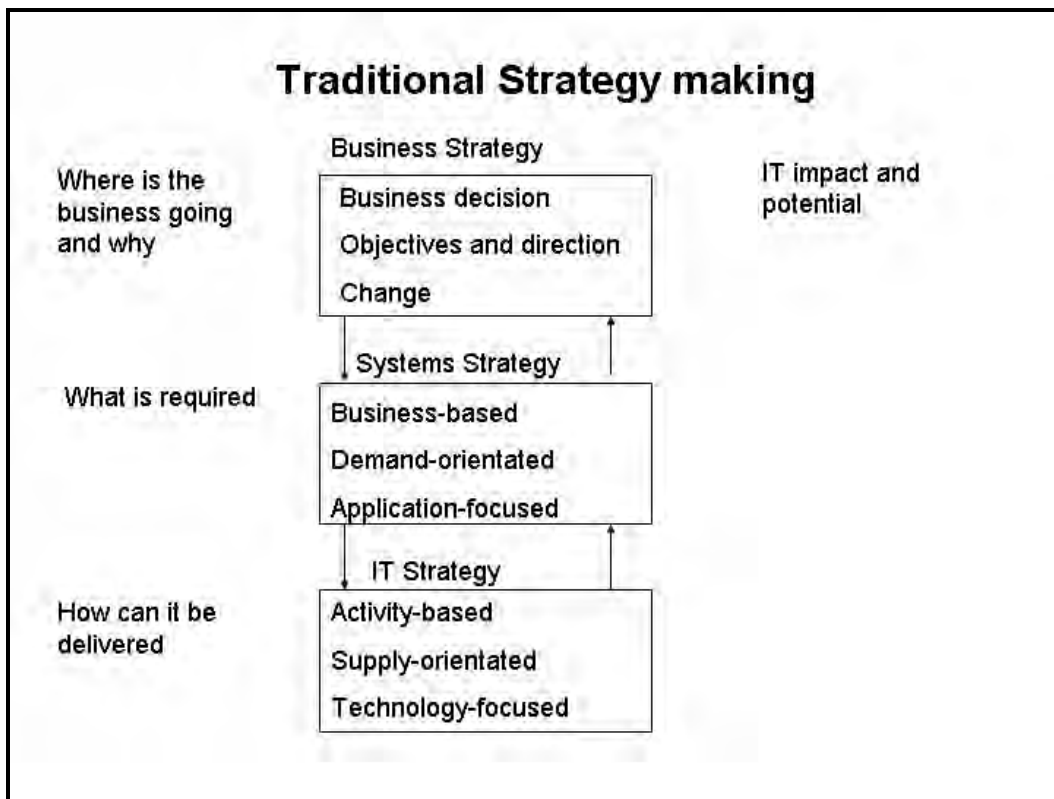


Figure 3-6 Traditional strategising - Woolfe, McNurlin and Taylor (in McNurlin and Sprague, 2004)

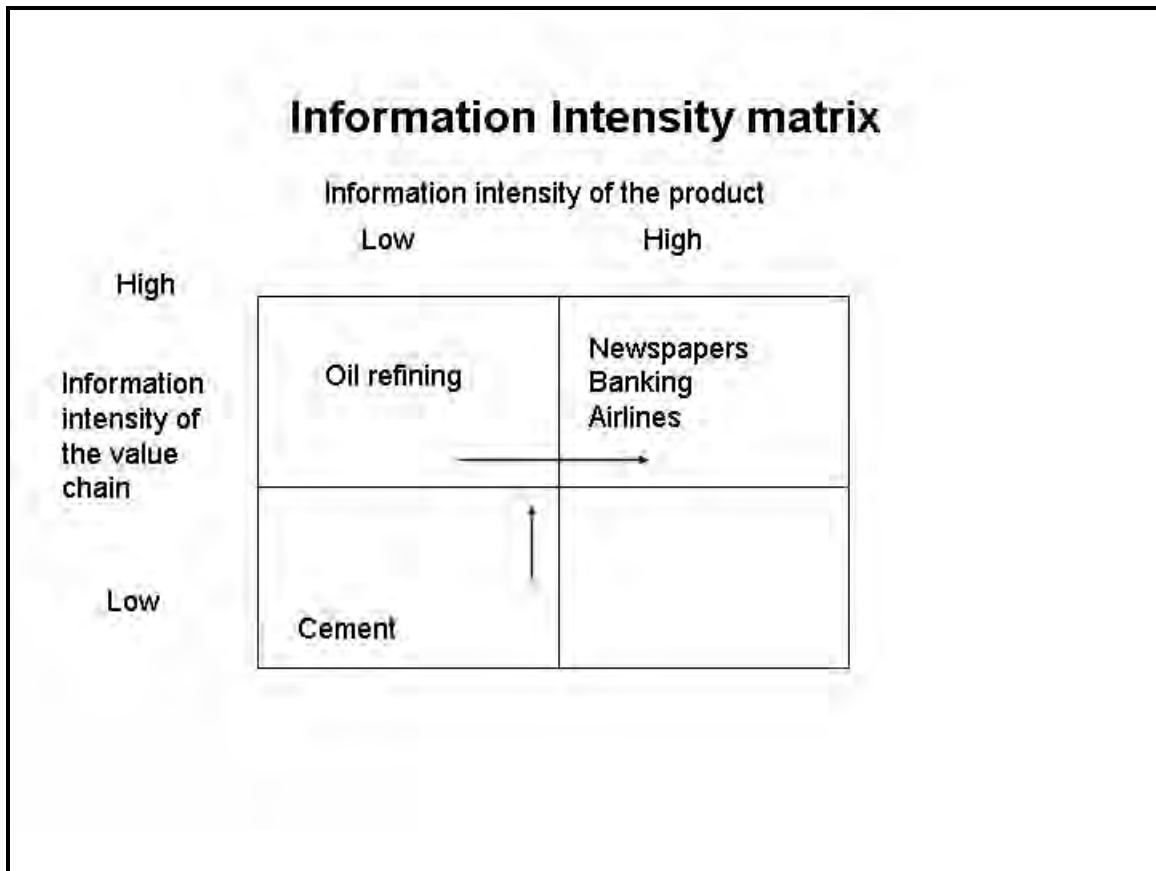


Hackney, Burn, Cowan and Dhillon (2000) state that in information-intensive organisations especially, IT and business strategy are not discrete, but intrinsically linked. Whatever the view, strategic management for IS/ICT (SIPM) follows the same processes as the process for organisational strategic management: analysis and planning; implementation and monitoring.

### **3.8.1.1 Analysis**

Analysis and planning can take place simultaneously. Analysis includes scanning the external environment as well as analysing the internal context of the organisation and the IS/ICT function.

Various analysis mechanisms have been suggested by writers. The techniques used here are often the same as for strategic management (SWOT, PEST, Value Chain analysis, Balanced Scorecard are examples of management techniques), but some deal specifically with IS/ICT and linkages. McNurlin and Sprague (2004) categorise seven techniques that are commonly used: Stages of Growth, Critical Success Factors (Robson, 1994, Shank, 1985); Competitive Forces model; Value Chain analysis; Internet Value Matrix; Linkage analysis planning; and Scenario planning. Another technique used to analyse IS/ICT needs, and closely allied to the grid in Figure 3-7, is suggested by Porter and Millar (in Ward and Peppard, 2002). Porter and Millar categorised organisations according to the information intensity of their products and value chain. This has implications for judging how strategically important IS/ICT is or can be. It is also an important tool in judging how far the existing portfolio of systems meets the needs of the organisation, and the relative importance of the systems.



**Figure 3-7 Information Intensity - Porter and Millar (in Ward and Peppard, 2002)**

Porter and Millar state that historically products have always had a physical as well as an informational content, but that with the increasing use of technology the informational content is increasing. Products also process information in their normal functioning (for example a microwave oven). Different industries are more information intense than others and Figure 3-7 gives examples. The arrows indicate that with technological advances, industries are becoming more information driven in process and product according to the writers. It is possible to position an organisation on this grid, and assess the required status of the IS/ICT Division. Budget for IS/ICT in the low/low grid is likely to be small, whereas if the organisation falls in the high/high quadrant of the grid and the budget percentage is low, it should be a cause for concern.

Analysis using this grid can be conducted by asking business areas what they want (a wish list), examining the business strategy documentation to prioritise these, setting up Critical Success factors (CSFs) for IS/ICT to support these; and then developing the IS/ICT strategy in conjunction with the business strategy (Ward and Peppard, 2002).

In the 1990s, the vogue was to use IS/ICT to gain a competitive edge for the organisation. A backlash has occurred, and the prevailing sentiment is that technology is imitable, as stated, and therefore does not lead to a sustainable competitive advantage. However, strategic management of IS/ICT is still necessary as failure to use technology can lead to competitive disadvantage, and what has become a standard is the need for IS/ICT strategies to support business strategies. McNurlin and Sprague (2004:120) state that in this model, IS supports and follows business, in that it seeks alignment with business needs, - they support “sense and respond” strategy-making. However, they quote Benson, Parker and Trainor who stated that IT had the possibility to influence the way business was conducted by demonstrating IS/ICT possibilities.

### **3.8.1.2 Planning**

Strategic planning is vital, and according to Cohen (2002), is one of the factors for IS/ICT functioning successfully. IS/ICT planning used to be conducted from a prioritised IS wish list or from technical (ICT) infrastructure planning. The well-established framework by Zachman (1999) was an attempt to formalise IS/ICT planning in the late 1980s and is still being used.

IS/ICT strategic planning can be defined as the process of identifying a desired portfolio of applications for implementation, which is highly aligned with corporate strategy and has the possibility of creating a competitive advantage (Ward and Peppard, 2002), and should espouse aims of:

- Determining priorities for investment based on business strategies
- Gaining competitive advantage for an organisation through use of IS/ICT
- Building a cost effective, but flexible IT infrastructure for the future

- Developing competencies and resources to support the above (Ward and Peppard, 2002: 118).

These factors encompass the whole spectrum of strategic management, and not just that of planning.

Sullivan (in Ward and Peppard, 2002) states that planning should incorporate more than the traditional uses of IT for data processing. It should include a wider spectrum of technologies, specifically with the view of introducing newer emerging technologies, and to integrate them with the existing technological base. Sullivan thus supports using IS/ICT innovatively.

The American Productivity and Quality Centre (APQC2004) proposes a framework of processes for “managing information technology and knowledge”. One of the first processes is planning for information management and some of the sub-processes are:

- *Understanding the information and knowledge needs of business and users*
- Defining service levels
- *Developing information and knowledge management strategies*
- *Deriving information systems requirements from business strategies*
- Defining information architectures, establishment of data standards
- Specifying security and controls
- Marketing IT capabilities
- *Developing an IT plan*
- Managing projects, supplier and customer relationships and satisfaction. (ibid).

The processes as listed above appear to fall under different categories, some strategic and some governance and management issues. The italics indicate the author’s view on the processes that need to be considered for strategic importance, analysis and planning, and that tally with views expressed by the quoted writers.

### *3.8.1.2.1 Difficulties of IS/ICT planning*

Earl (1996) states that there are five approaches commonly used for IS planning, each with attendant problems. These are:

- Business-led approach: the problem is that the business strategies are not clear enough, and users are not sufficiently involved
- Method-driven approach: proprietary consultant methodologies are used for planning, but users are uninvolved
- Architectural approach: IS plans are produced, but they are too complex for management
- Administrative approach; resources are allocated based on a committee decision, using a bottom-up approach (such as based on requests), but favouring business as usual
- Organisational approach: this is a team-based approach between business and IS, and is fuzzy, so more difficult.

Earl writes that the organisational approach appears best, but not when the organisation has a strong focus on downsizing as participants may be involved in retrenchments. He suggests that the use of evolutionary change, teamwork, education and eclectic methods help with planning. Venter (1992) largely supports this view, particularly the team work and educational features. The organisational approach is supported by researchers such as Ward and Peppard (2002), who hold that for an IS/ICT strategy to be successful, it needs business, but specifically top management, buy-in. This is often difficult to obtain, since top management may lack the knowledge to assess the impact of an IS/ICT strategy; they do not see information as a major resource requiring management; the inflated expectations for IS/ICT are viewed with suspicion; they expect a financial justification for any IS/ICT costs, and they have a short term focus for planning that extends to a reluctance for longer term planning for IS/ICT.

Segars and Glover (1999: 216) suggest that IS/ICT planning can be divided up into different “schools”: the Design school whereby strategy is invented by senior management; the Planning school whereby strategies are “moulded by policies”; the Positioning school where strategic planning is an analytical process whereby a position is selected; the Learning school in which strategic planning is an emergent process; and the Political schools where planning is a power process. They note that rationality and adaptability are both required.

Aladwani (2002) states that his research supports the importance of management support and informed information management, but that user involvement is not correlated with planning effectiveness in a developing country.

#### ***3.8.1.2 Level of formality of planning and analysis***

Writers question the use of very formal SIPM, especially in a changing context. Figure 3-6 depicts the “ideal” or traditional means of IT management, but McNurlin and Sprague (2004: 118) state that this formal method is predicated on:

- A predictable future
- Time available for this type of planning
- Top management being best suited for planning by being best informed
- A top-down process (hierarchical management).

Brown and Roode (2004) find that the SIPM process has characteristics of formalism and adaptability depending on the culture of the organisation and its stance towards centralisation. They contend that in times of high environmental uncertainty, a rigid approach to SIPM may take too long, and thus be inadequate for the new environment. They also mention that adaptive planning has a component of evaluation and revision embedded in the planning process. Sullivan (in Ward and Peppard, 2002) states that there needs to be a shift away from more formal to more flexible approaches.

The context of the organisation and the strategic importance of IS/ICT may have an effect on the level of formalism of SIPM. Clarke (1994) quotes Ciborra to note that a gap exists in the literature of SIPM in examining its applicability to “organisations which are not subject to powerful market-based competitive forces”, especially where the definition of strategic IS is restricted to systems that “confer a unique sustainable or otherwise significant advantage”. Not-for-profit or public sector organisations should stress strategies for efficiency and effectiveness as this is expected by customers, rather than competition.

Writers mention the complexity of planning in an uncertain and changing environment, stating that although the importance for organisations of SISP is not in dispute, the level of SISP that should be embarked on may be “too little or too much” (Newkirk, Lederer and Srinivasan, 2003: 201). They note that researchers have suggested that too little produces inadequate strategies, while too much may require so much time that the environment will have changed, rendering the plans obsolete before they are implemented.

### **3.8.1.3 IS/ICT implementation and control**

The next two phases of SIPM are implementation and control. The objectives that have been set need to be matched against the resources. Hartono, Lederer, Sethi and Zhuang (2003) state that implementation is a major problem and they quote that of the firms investigated, only 42% of the projects had been implemented five years after planning. Systems have often failed to deliver on their promise, some not being installed on time or within budget, some not being used since they do not meet users’ needs or expectations, and some cancelled before delivery (from the often quoted Standish report: Chaos: A recipe for success, 1999).

Management of the IS/ICT function implies correct staffing and reporting lines, acquisition and maintenance of the technical infrastructure and thus issues of sufficient budgets and managing these, good governance in terms of policies and procedures regarding usage and security (the latter is an ongoing evolving concern), service level

agreements, disaster recovery, transparency of processes, and published project portfolio plans. Schwarz and Hirschheim (2003: 129) state that “if organisations focused more on implementing a sound IT governance strategy, it might help senior executive management to manage not only the IT related activities, but also the perceptions between IT and the rest of the organisation”. Weill (2004) states that superior returns for organisations are achieved through a combination of factors, one of which is effective IT governance.

For control, monitoring mechanisms like the Balanced Score Card approach is commonly used.

### **3.8.2 Success of SIPM**

Ward and Peppard (2002: 140) summarise features that would indicate the success of the IS/ICT strategic management processes, which include:

- “Improving the contribution of IS/IT to the performance of the organisation
- Gaining competitive advantage through use of IS/ICT
- Identifying new or higher payback applications
- Identifying strategic applications
- Increasing top-management commitment
- Improving communications with users
- Better forecasting of IT resource requirements
- Improved allocation of IT resources
- Development of an information architecture
- Increased visibility for IS/ICT in the organisation”.



### **3.9 Intersection of organisational strategies and IS/ICT support**

Although the SIPM process may be a success in terms of processes, there may still be a perception of “lack of value” from the IT resource. Ongoing debate exists on whether IS/ICT strategic planning is effective and whether IS/ICT investment has actually been of benefit to organisations. Writers have attributed this to the famous lack of alignment between IS/ICT strategies, and organisational strategies. This misalignment is perceived as having the effect of IS/ICT hindering business strategies and objectives, let alone enabling new competitive strategies. Sabherwal and Kirs (1994) temper this somewhat by stating that alignment is important, but the importance depends on the strategic posture chosen by the organisation. They state that alignment is less important for organisations who have a stable niche in industry, offering high-quality standard products at low prices (using “defender” strategies), and who stress operational efficiency and economies of scale.

Alignment has been cited as a critical management issue since the 1980s (Brown and MacGill, 1994; Chan, Huff, Barclay and Copeland, 1997; Luftman, 2000; Ragu-Nathan *et al.*, 2001; Reich and Benbasat, 1996) and is an ongoing problem.

However, alignment at not only the strategic level is important. Alignment has been expanded to include the (lack of) support at management and operational level for the implementation of organisational strategies. Ball, Adams and Xia (2003) state that alignment consists of a fit between IS/ICT strategies and business strategies, and IS/ICT strategies and IS/ICT infrastructure. They therefore state that alignment must be at all levels and furthermore that the IT infrastructure must be aligned with the IS strategies (Ball *et al.*, 2003). What this implies is that what is needed is an effective and efficiently operating IS/ICT function, that is strategically managed, and which as a whole supports the strategic processes from planning to implementation, of the organisation.

### 3.9.1.1 Success of alignment – how to ensure alignment

Researchers have identified three areas of research regarding alignment:

- The **processes** by which alignment is achieved especially in the planning activity
- The (organisational) **factors** that allow alignment to take place (Ball *et al.*, 2003)
- The **impact** of alignment on organisational success.

#### 3.9.1.1.1 Processes

Luftman (2000), as well as Hirscheim and Sabherwal (2001), state that achieving alignment is an ongoing process emphasising strong senior management support, building good relationships, and fostering business and IT understanding. It hinges on good strategic planning and SIPM. Consensus exists that these processes are necessary for IS/ICT strategy and business strategy alignment (Hackney *et al.*, 2000; Luftman, 2000; Reich and Benbasat, 2000; Ward and Peppard, 2002). The processes encompass the factors for success.

#### 3.9.1.1.2 Factors

The factors for success of alignment unsurprisingly mirror factors for the success of SIPM. These can be divided into four categories:

##### **Management culture:**

- Senior executive support for IT and IT leadership's position in the organisation is important with appropriate formal reporting lines and committees, and leadership should also be demonstrated by IT.
- IT Governance has become very important. The definition of the term varies, but the explanation by Flint (2005) - see Glossary- is used in **this** research, as encompassing decision-making on policies and finance for IT. Policies include policies on security, reliability and compliance with legislation. IT governance is reported to be

important in generating a common approach between business and the IT Division (Flint, 2005). Thus a good governance structure assists in alignment.

- High visibility of the value of IT to business goals should be pursued.

**Business-IT understanding:**

- Shared domain knowledge should exist between business and IT executives (the IT function should understand the business and vice versa), as well as good communication between business and IT executives. A business-IT partnership is useful. Chan (1999) adds informal networks (and relationships) as important antecedent factors.

**Planning:**

- IT planning is required, and IT should be involved in the organisational strategy process.
- Linked business and IT mission strategies should exist.

**IT profile:**

- IT implementation success through well-prioritised IT projects,
- IT meeting commitments, resulting in business satisfaction with IT,
- IT management involving appropriate career paths and incentives and performance management for staff.

(Chan, 1999; Chang and King, 2000; Hackney *et al.*, 2000; Luftman, 2000; Luftman, Papp and Brier, 1999; Reich and Benbasat, 2000; Ward and Peppard, 2002).

***3.9.1.1.3 Problems with achieving alignment***

Fiegener and Coakley (1995) note problems with alignment success especially regarding communications between business and IT: CIOs have difficulty in influencing top management's impressions of IT performance because they have limited organisational knowledge; their communication style is poor; their track record of performance is poor;

they are at a distance from top management; their IS performance measures are ambiguous; and their CEO(s) have a limited understanding of IT. They describe tactics to circumvent this, which echo the processes for successful alignment, such as developing relationships, negotiating performance measures, building a track record, and (interestingly) hiring consultants for objectivity.

Hirschheim and Sabherwal (2001: 101) note that business, strategy, IS role, IS source and IS structure are involved in alignment: “Executives often recognise how difficult it is to change business and IS strategies in a unified fashion”. Brown and Roode (2004) write that a mature and competent IS function may offset shortcomings posed by poor quality business planning. Tallon and Kraemer (1998) state (as do Ball *et al.*, 2003) that process level alignment is a better measure of alignment success than corporate alignment. This statement may reflect statements made that strategic planning may be good, but implementation often fails.

It can be acknowledged that strategic planning and management do not always occur in textbook fashion, or as in the past, set monolithically for the long term. Various writers have identified an emergent quality to strategising (as depicted in Figure 3-1). Hackney *et al.* (2000), while not questioning the need for strategic planning and alignment, state that the strategy process is complex and diverse and that a match is increasingly difficult. Indeed they state that research does not necessarily support the fact that Strategic Information Systems Planning (SISP) can align IS and business strategy since the rational approach is too simplistic. They support the emergent or entrepreneurial school of strategy formulation. Ward and Peppard (2002) note that strategic planning is an ongoing process. It would appear that there is always a tension between bottom-up and top-down planning, and the planning process must balance between radical change and continuous improvement.

#### ***3.9.1.1.4 Assessing alignment***

Much research has been directed at the process of and factors for alignment. The major focus has been on the process of planning and the factors needed to ensure success, with

some research focused on measuring success of alignment. The issue of how to analyse the gap between business and IS strategies has occupied less territory<sup>3</sup>.

Luftman (2000) has devised an instrument to assess alignment maturity that measures six dimensions, namely Communications; Governance; Competence/Value measurements; Business/IT partnership which refers to the business perception of IT and relationships with management and the business; Scope and architecture; and Skills. This instrument takes into account the factors and processes that are quoted as being at issue in alignment (see Section 3.9.1.1.2). Cobit<sup>®</sup> is another maturity model used to assess IT alignment, although in the author's opinion the alignment referred to has narrower focus than strategic alignment in the literature, since its focus is "control of the full IT" (Brand and Boonen, 2004: 34).

### **3.10 The use of IS/ICT in organisational transformation**

#### **3.10.1 Difficulties of planning and alignment in a context of change**

There cannot be much argument that planning is vital in a changing context. Consensus is that SIPM is not an easy process and the context of change makes IS/ICT strategic planning even more problematic. Kanter (2002) mentions the changing role of IS/ICT planning – it is no longer a once-a-year process, but a continuous process. Even in a stable environment, SISP is not a simple matter. It is also recognised that the process has emergent qualities (Hackney *et al.*, 2000). These emergent qualities are further exacerbated by the ever-more rapidly changing environment, necessitating adjustments to

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<sup>3</sup>There appears to be a trend towards using maturity models such as Capability Maturity models to assess aspects of information systems and technology provision, security, as well as levels of alignment.

strategy. However, Vitale, Ives and Beath (1986) suggest that the adaptive approach is a useful approach when turbulence in the environment is evident.

Alignment with organisational strategies is equally fraught, especially in a changing environment where the technological change is fast, and organisational strategies, the organisation itself, and its environment are in a state of change (Clarke, 1994; Hackney *et al.*, 2000). Alignment has been identified as a necessary factor for business success. In a changing environment, this may be more difficult to achieve: Brown and Roode (2004) state that in volatile environments, business strategies change rapidly and this makes alignment difficult. Any changes affecting organisational strategies may also affect IS/ICT strategies. The need for flexibility counters traditional planning where strategic planning requires a long term view, and IS/ICT planning that often requires long implementation cycles may be too cumbersome to support the organisation. IS/ICT could well be a hindrance to fast changes in strategy especially if the architectures installed or being installed are inflexible and costly.

To cope with changes in the environment, strategic IS/ICT, and IS/ICT and Business alignment must be revisited whenever changes occur. Ward and Peppard (2002) mention the following events that should/could trigger new or revised planning processes:

Externally: New technologies or opportunities that need to be examined, for example, wireless technology.

Internally: New products or markets; Response to regular business planning cycle; Major rationalisation that may affect the IT budget; Takeover or merger; Business reengineering through restructuring.

Choe (2002: 266) states that in an uncertain environment, “a high level of strategic (IS) applications and well-arranged facilitators of alignment can contribute more to the improvement of performance” than in more stable environments. Thus he underscores the importance of choosing applications that may be strategic in a changing context.

### **3.10.2 Factors supporting change**

As regards IS/ICT and change, there are three specific areas in which IS/ICT can support organisations in a changing context that will be explored further:

Firstly, IS/ICT has the potential to show leadership in exploiting IT for leading change. The “competitive advantage” trends through IS/ICT enabled processes of the 1980s are examples of this. The author contends that the pendulum has swung perhaps too far in the flight against technology leading business strategies, to ignoring the potential to create new avenues for the business. This is particularly necessary in the more dynamic and global environment in which organisations operate. There is the possibility of exploiting change through innovative use of IS/ICT. Sambamurthy, Bharadwaj and Grover (2003: 237) propose that the value-added role of IT lies in its ability to allow an organisation “to launch frequent and varied competitive actions”.

Secondly, organisations may have defined strategies to cope with change, but it is generally accepted that to change successfully, organisations should also look for possibilities that may be realised through IS/ICT, and be flexible or “agile”. Customer responsiveness would be an example of this (Brynjolfsson and Hitt, 2000). Tallon and Kraemer (1998) write that there are two sides to the alignment issue: a technology shortfall when IT does not match business strategies and a business shortfall when business strategy does not take account of IT capabilities. Broadbent and Weill (1997) state that an IT infrastructure could be viewed as supporting organisational strategy by cost reduction, but also by providing flexibility for future goals.

Lastly, a flexible IT function can support organisations in the changing contexts. Writers note that an organisation that can respond to new challenges swiftly can be characterised as a flexible environment. Structure, availability of information, levels of knowledge management and learning, and effective processes are reportedly features of such an organisation that have implications for IS/ICT. Duncan (1995) argues that good planning alignment diminishes the need for flexibility, but does not remove it.

### 3.10.3 Support for flexibility

#### 3.10.3.1 Structure

Technology has been touted as an enabler of network structures, more transparency, devolved decision-making, and flexibility. Malhotra (1993) quotes Mintzberg as stating that in a dynamic environment the organisation is driven to an organic decentralised structure, and introducing IT transforms a bureaucratic administrative structure into an organic (adaptable) one. “Informed” workers are needed to cope with turbulence and IT gives them better information to perform higher-level tasks. He also maintains that in turbulent environments inter-organisational linkages make organisations more flexible and IT supports this. Schwarz (2002: 154) quotes writers such as Palmer and Dunford to suggest that a change in technology promotes democratisation by having a decentralising force on information and organisational politics. He calls this “new-form organisational theory” in which “technological innovation is a critical component that is both driving and enabling change in different business environments” leading to more flexible structures, decentralisation and information dissemination, amongst others.

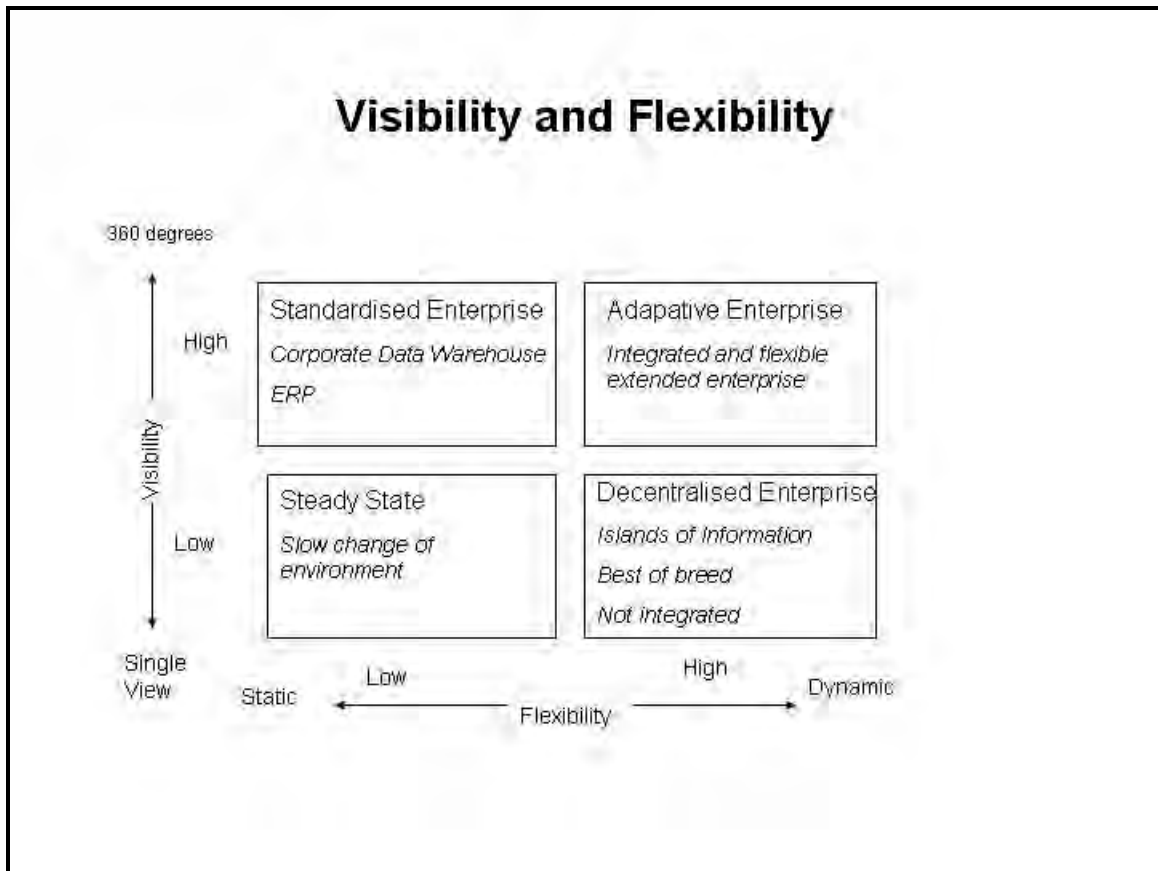
On the other hand, Schwarz (2002: 157) states that the use of “IT has not been found to bring about significant change in decision-making, authority or political schema” and quotes Townsend, De Marie and Hendrickson (*ibid*:155) that innovation “supplements rather than eliminates existing organisational structures”. Information Systems have been shown “to maintain existing administrative structures, to centralise control and to enhance power for those in positions of authority”, and his case studies demonstrate that the introduction of a new system did not change the structures of two public organisations. He quotes Laudon who states that despite the possibilities for change afforded by technology, established interest groups can obstruct reform threatening their power. Robey and Boudreau (1999) agree that the issues are not clear, by stating that researchers have made contradictory findings on the effects of technology such as: empowered employees versus oppressed employees; extended hierarchy versus reduced



hierarchy; organisational rigidity versus organisational flexibility; and increase in staff versus downsizing.

Evgeniou (2002), somewhat by contrast to these opinions, holds that flexibility is required when an organisation runs on a matrix structure, and particularly when mergers are taking place. This seems to imply that a matrix structure is not necessarily flexible.

Figure 3-8 depicts four types of organisations with their typical ICT infrastructure :



**Figure 3-8 Information and adaptive organisations - Evgeniou (2002)**

Figure 3-8 depicts the “visibility” required of data across the organisation, depending on the levels of change and structure of the organisation. He thus implies that in a networked (adaptive) organisational structure, full visibility of information is required (top right quadrant – where the organisation is in a dynamic state).

Malhotra (1993) states that the more complex the environment, the more appropriate a decentralised structure is. Ashby, quoted by Malhotra (1993: 8), suggests that IT is an enabler for an organisation to be able to adapt, as “complex systems require complex controllers” in terms of systems theory. This statement supports the idea of network structures being linked to the theory of complex adaptive systems (see Section 3.5). IT can serve as complex controllers by enabling external (and internal) monitoring. Malhotra uses open systems theory for postulating that IT can allow firms to be more organic and hence adjust better to turbulence. Figure 3-9 (adapted from McElroy (2002)) depicts a Complex Adaptive System (CAS) from complexity theory. The significance of this diagram lies in the detectors and the feedback loop, and the possibility of using IS/ICT as a detector.

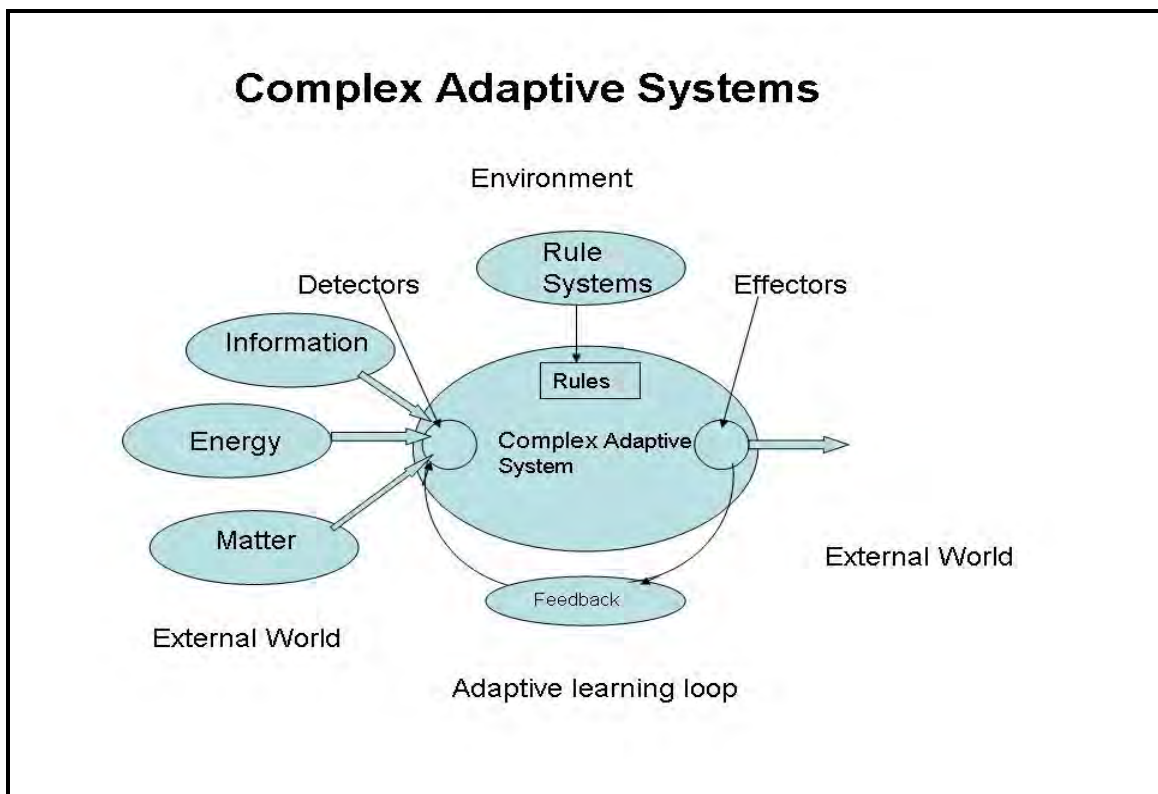


Figure 3-9 Complex Adaptive Systems (CAS)

### **3.10.3.2 Information availability and need**

Closely allied to a network structure is the need for information. Writers state that to support network structures, information is important. For data and information to increase flexibility, it requires features of transparency, visibility (Evgeniou, 2002) and range of types of information to be shared. IS/ICT is a means of acquiring and accessing information more easily – the CAS diagram indicates this use (detection). Malhotra (1993) writes that IT enables flexibility because it provides information to detect and assess the changing environment. Turbulent environments drive organisations to empower workers through IT information availability. Sabherwal and Kirs (1994) write that uncertain environments imply an increased need for information and information processing. Patterson, Grimm and Corsi (2003) concur, stating that IT allows firms to share information more quickly thus allowing firms to have greater organisational flexibility and better response to changing environments. Writers (for example, Dibrell and Miller, 2002) state that IT is significant in transforming organisations from industrial-type organisation to “information-age” organisation due to the facilitation of coordination and communication. Makridakis (1995) supports this by stating that IT enables new forms of organisation and management, specifically much flatter loosely-coupled, horizontal or network structures. These types of organisations allow more frequent and horizontal informal communication Andersen and Segars (2001) state that this allows for faster decision-making. There is often more emphasis on results.

The adaptive enterprise is thus a networked organisation requiring high visibility of data and high flexibility.

### **3.10.3.3 Learning organisations and Knowledge Management**

Learning Organisations are held to be more flexible, and the better their Knowledge Management, the better their ability to learn and cope with uncertainty and change. Although the debate rages between consultants about the role of IS/ICT in KM, authors such as Andersen and Segars (2001) hold that IS/ICT is a vital component in enabling KM and therefore a flexible organisation. This is somewhat disputed by Hendriks and

Vriens (1999: 114) who note that capturing knowledge into a knowledge-based system may increase the rigidity, decrease the “incentive for thought” in an organisation and runs the risk of providing static information. Holland and Lockett (1997: 476) state that information technology is an “important enabling tool” for organisational change while looking particularly at the aspects of communication enabled by IS/ICT with trading partners in inter-organisational systems.

#### **3.10.3.4 Effective processes - BPR**

By definition, business process reengineering implies change, and historically implied more effective change through process redesign incorporating IS/ICT (usually to allow for a more networked organisation). Bjorn-Andersen and Turner (in Galliers and Baets, 1998) describe a case epitomising this use of IS/ICT. They note that IT was the critical enabler for this type of organisational restructuring. Similarly, Broadbent, Weill and St. Clair (1999) found that a more extensive IT infrastructure such as networks, standards, management of firm-wide databases, firm-wide management information, and cross-unit activities enabled by reach and range as defined by Reed, was an enabler for successful BPR and thus flexibility (Broadbent, Weill and St Clair, 1999; Reed).

Mergers can be seen as necessitating process restructuring. Gurjar, Manoj, Jog and Amanullah (2002) specify three types of MIS systems involved in mergers: Legacy, ERP and extended ERP systems. They focus specifically on vertical mergers in cases where the scale of IT operations is similar. They relate the success of various combinations of merging systems with the information importance of the systems for the organisation. One thus has either a legacy/legacy, legacy/ERP, or ERP/ERP combination - for the latter there is the assumption that the ERP systems are different (if they are the same, simple migration would be less problematic). Retention of legacy systems is possible where decentralisation or distributed processing is possible, but there may be loss of potential for growth. The writer proposes that merger risks and information systems merger risks are related to the information intensity of the product or organisation. This echoes the diagram of Evgeniou (Figure 3-8).

### **3.10.4 Features of a flexible IS/ICT function**

As stated, an efficient, effective IT function is a prerequisite for success. However, the way the IT function is managed and structured may have an effect on its ability to respond flexibly.

#### **3.10.4.1 Management**

Writers note that flexibility is enabled by effective management of the technology, IT management's business knowledge, knowledge of IT by organisational management, and technical skills of IT management. Thus lack of good leadership can impact on flexibility.

#### **3.10.4.2 Structure**

IS/ICT can be structured to match the organisation with respect to centralisation and decentralisation or distributed/networked. Writers argue whether the match is necessary. Evgeniou (2002) writes that visibility and flexibility can be opposing factors when using centralised or decentralised systems. For example, if all units have to operate in the same way, this limits innovation and flexibility, but allows visibility of information. Allen and Boynton (1991) discuss two polar opposites of centralisation and decentralisation of data and information:

##### ***3.10.4.2.1 Decentralisation***

Decentralisation at the extreme has the "low road option" of no standards and virtually discardable systems at one end of the spectrum. This appears to lead to strategically beneficial systems with responsibilities devolved to subunits, but problems are cost, lack of integration, and problems with data integrity and sharing.

##### ***3.10.4.2.2 Centralisation***

"High road" centralisation allows for (paradoxically) speedy system restructuring, integration, efficiency, flexibility through organisational independent systems, and strategic use, but with disadvantages of expense, need for customisation, management

planning dependence, distrust by lower levels of managers of central solutions, and solutions that may never be completed.

Allen and Boynton (1991) are of the opinion that organisations need a mix of approaches. Too much centralisation of data leads to a loss of ownership and too much decentralisation leads to a lack of integration and redundancy.

Choices need to be made in order to balance efficiency with flexibility, and tradeoffs need to be considered.

### **3.10.4.3 Service**

The quality of the service rendered by the IT Division is a reflection of the efficiency and effectiveness of the IT division. Various methods have been proposed to measure this quality. One of the most prominent is the Servqual instrument (Jiang, Klein and Carr, 2002; Kang and Bradley, 2002; Myerscough, 2002; Van Dyke, Kappelman and Prybutok, 1997). The quality of the service is related to the responsiveness and flexibility of the Division. Chang and King (2000) use the term service performance to indicate quality and flexibility.

### **3.10.5 IS/ICT – an inhibitor of change**

IS/ICT may be viewed as an inhibitor of change.

The technology – hardware and software - may itself inhibit change, as may also the lack of flexibility of the IS/ICT function (Byrd and Turner, 2001; Chung, Rainer and Lewis, 2003; Duncan, 1995; Ward and Peppard, 2002).

#### **3.10.5.1 IT flexibility**

In the climate of fast change, organisations succeed by being able to grasp new opportunities fast, and by being innovative and flexible. To support this, a flexible IT infrastructure is required, and this has been a source of concern in IS/ICT management. Architectural decisions are costly and are usually long-term. The features of a flexible infrastructure include IT connectivity across platforms, exemplified by the support of a

wide variety of hardware, software and communication technologies, and is said to promote “reach” (Reed) and ease of diffusion of information. Writers argue that IS/ICT systems are a hindrance to business strategy formulation “paradoxically, the business strategy formulation is often constrained by the legacy of IT systems” and the problem with IT development is that stability and predictability are required (Allen and Boynton, 1991; Hackney *et al.*, 2000: 7).

### **3.10.5.2 IS flexibility**

With respect to application software, the choices are between customised software and packages or ERP systems. In-house development can take a long time, and this could hinder flexibility, as new needs for information may arise before the old ones are satisfied. Change may require IS redesign and this is a slow process (Attaran, 2001). Duncan states that “information-intensive” organisations require greater IS flexibility because of the number of unplanned systems that are required (Duncan, 1995: 38).

Flexibility can be achieved through standardisation of software by, for example, use of packages, although Duncan (1995) notes that such standardisation can stifle innovation. Once locked into an expensive Enterprise Resource “package” (ERP system), change can be difficult, and these systems tie organisations into “best practice” processes which may hinder new innovations. Hagel and Brown (2001) support this view, stating that ERP systems limit flexibility. Evgeniou (2002) notes that ERPs are criticised for their rigidity. This view is countered by proponents of such systems, who state that ERP systems allow greater flexibility by providing better cross-functional and cross-organisational information, and huge functionality.

Writers agree that a modular approach/layered approach to software by, for example, using object orientated technology and reusability of components, and web services allows for greater flexibility (Hagel and Brown, 2001; Huang, 2004). Application functionality and flexibility is enhanced by reusability and whereby a resource can be used for more than one purpose. These are relatively new technologies, and skills may be a problem.

Legacy systems which abound in large organisations have been named culprits in preventing organisations from change. In a report, Gurjar *et al.* (Gurjar *et al.*, 2002) note that legacy systems may be unique and therefore give organisations a competitive advantage. It is thus worth considering retaining the legacy systems for this purpose. This does not, however, imply that it makes the organisation more flexible.

### **3.11 IS/ICT challenges specific to South Africa and Africa**

#### **3.11.1 Infrastructure**

The infrastructure in developing and developed countries is vastly different. The telecommunication infrastructure is characterised by erratic telephone, fax and postal services and limited internet connectivity (Horton, 2000), limited bandwidth available, and the speed thereof. Dewan and Kraemer (2000) and Huang (2001) note that less-developed countries have poorer (IT) infrastructure. Horton (2000) does state that South African researchers more closely echo concerns of the “North”.

#### **3.11.2 Importing technology - costs**

South Africa (like the rest of Africa) is an importer of technology. There are examples of software systems created locally that have been successfully exported, and the services based on the technology are successful, but in the main, organisations in South Africa are followers of what is developed and used elsewhere. The costs of technology, given the rate of exchange and import duty, are large. Organisations, although big according to South African standards, are by and large small by world standards. The scale of business is not big enough to justify the investment that is made in IS/ICT by global organisations (Savage, 2003). Outsourcing is one way of meeting the challenge, by allowing the service providers to have the critical mass to justify large expenditure. An undersupply of skills still exists, but it is less acute than before and services can be obtained globally (thanks to technology).



### **3.11.3 Skills**

IS/ICT has the potential to support employees for greater involvement in decision-making, but its use often presupposes skills of computer literacy and analytical ability in the use of information. Huang (2001) notes lack of IT experience as a hindrance to IT usage. In South Africa, given the historical background, this experience is often lacking. This is similar to other developing countries. Dewan and Kraemer (2000) mention the lower levels of human-capital as a by-product of poorer education. Government is making a big effort to improve the computer literacy of the nation through training for government officials and learnerships in IS/ICT for unemployed youth. However, computer literacy is sometimes a necessary, but not sufficient, condition for effective IS/ICT usage.

### **3.11.4 Cultural differences**

Technology acceptance may be different in developing and developed nations. A study by Anandarajan, Igbaria, and Anakwe (2002: 60) notes that developed countries are typified by “doing cultures” where accomplishment, hard work to achieve goals, and maximisation of work efforts are stressed. Individuals from these countries are motivated to use technology for effectiveness and efficiency as well as self-advancement. By contrast some, for example, West African countries, are “being centred” who minimise work, doing only as much as is needed to live, and such individuals use technology depending on management setting standards to be followed.

Huang (2001) mentions the difference of the language of use of technology (English) and the language of the developing country (he uses the example of China, but this could apply to Africa as well). Dewan and Kraemer (2000) note that developing countries often have outdated business models and Huang (2001) writes that developing countries “lack a culture that regards computers as a pervasive way of doing business” (Huang, 2001: 282). ERP systems are largely developed in the USA or Europe, and imply processes that do not necessarily fit local conditions (technology imperialism). The dominant language is English, and this can be a barrier to technology acceptance.

### **3.11.5 Government Policies**

Huang (2001) and Dewan and Kraemer (2000) state that the regulatory environment affects the exploitation of IS/ICT. Dewan and Kraemer name factors that could encourage IT exploitation such as policies to promote education in general and computer usage in particular as policies that could improve usage. They mention “the enactment of low taxes and tariffs on computer imports”. Another vital feature is the liberalisation of telecommunications. In South Africa, the national carrier had sole control over the telecommunication environment, although that is changing.

### **3.12 Transformation and IS/ICT with a focus on SA issues**

Organisations change or transform variously in order to survive or compete in a changing environment (reactively or proactively), and in order to respond to social and contextual issues.

#### **3.12.1 Decentralisation and empowerment**

In South Africa, the black majority is often categorised as having been historically “disempowered”, and in the working environment, condemned to lower job levels. A hierarchical centralised organisation fosters disempowerment whereas decentralisation and network structures devolve decision-making. Thus, it could be said that in the interest of social empowerment, organisations should consider changing their modus operandi, while organisations are re-examining their HR processes regarding training.

The transformation from one structure to the other can be enabled by IS/ICT. As already discussed (see Section 3.10.3.2), access to available and pertinent information is key for this to happen effectively, and needs to be managed. As Bowen and Lawler (1995: 73) maintain, empowerment implies “information about, have the power to contribute to, and being rewarded for contributing to, organisational performance”.

Duane and Finnegan (2000: 243) believe that technology can enable empowerment. They state “one of the most important benefits of an intranet is its ability to empower

users by shifting the control of information flow between information creators and information users”. However, access to information is linked to patterns of control and organisations require the will to change. Large centralised organisations may seek information less for planning than control.

### **3.12.2 Control and transparency**

Devolved and speedier decision-making increases the organisational risk of mistaken decisions. This implies that accountability and transparency become more of an issue in decentralised organisations. Duane and Finnegan (2000: 243) quote Simons as stating that empowerment requires greater control... “the control systems, however, must balance empowerment and control in such a way that empowerment does not lead to a control failure, and correspondingly, control does not lead to empowerment failure”. Empowerment is necessary for building a responsive organisation. However, without standards, organisations lose their ability to coordinate effectively and to communicate. Control is the art of managing “the tension between creative innovation and predictable goal achievement” (ibid).

Regarding accountability, IS/ICT is of course a great enabler of control by making information more visible and accessible, as discussed for complex adaptive systems, and it is possible to track performance more easily. This could make allocation of measurable success or failure far easier. Accountability thus becomes much more visible.

If empowerment is seen as a transformational issue, then access to information and transparency of decisions need to be considered. IS/ICT has a role to play.

### **3.12.3 Knowledge Management**

In organisations where there is a large staff turnover, as was caused by BPR, and where valuable skills are lost, organisations have turned to knowledge management as a means of retaining the knowledge in the organisation. The capturing of organisational knowledge through the use of IS/ICT, whilst not without problems, is seen as one way of

enabling this retention, and indeed knowledge management is concerned not only with retention, but expansion of knowledge. Hartono *et al.* (2003) note that the SISP process generates a great deal of information about the organisation that could usefully inform the organisational knowledge management processes. In organisations, such as is happening in South Africa, where people are at present being appointed to management levels with relatively low experiential skills, and experienced (white) managers and workers are being replaced, knowledge management in the form of easily accessible information on policies, procedures, and best practice is an invaluable aid.

#### **3.12.4 Cultural transformation**

With mergers, but also with the whole focus on fast-tracking previously disadvantaged groups into management positions, organisations are experiencing cultural “shocks”. Organisations are searching for ways of attaining a unified culture. IS/ICT has the potential to enable this in two ways: greater possibilities of dissemination of organisational values through publishing on the intranet, and higher levels of communication between dispersed employees, which when coupled with the “colour-blindness” of email, may assist in fostering closer cooperation. Kraut and Attewell (1996: 14) found that extensive use of email increased organisational knowledge, and heavier use of email “was associated with higher levels of organisational commitment”, and commitment to management goals. They also found that the “spill-over” effect of email and the ease with which email was copied to multiple recipients, increased communication with people who were more geographically dispersed. This, of course, has implications for larger organisations where accidental meetings are less “dense” than for smaller organisations where face-to-face chance meetings are common.

#### **3.12.5 Information Intelligence**

Marchand, Kettinger and Rollins (Marchand *et al.*, 2000: 69) states that there is a need for a “people-centric view” of information management. They write that organisations have an “information orientation” composed of information behaviour values, information management practices, and information technology practices. Information

behaviour encompasses the softer issues of knowledge behaviour such as trust and sharing, and does not imply IS/ICT and information technology practice (as has been discussed in detail in this chapter). However, what Marchand and Kettinger call information management practice is relevant to this research. It is related to how information is detected, processed into useful information, maintained, organised by classifying and “training and rewarding employees for accurately and completely organising information for which they are responsible”, and collecting, which they describe as “developing filtering mechanisms” and “providing access to existing ... knowledge” (Marchand and Kettinger, 2002: 6).

As already mentioned, computer literacy skills are low for certain sections of employees. The author suggests that in organisations, especially in South Africa with its changing workforce, the levels of “information literacy”, and an appreciation for the importance of accurate valuable data are also low, both of which are exacerbated by low computer literacy. The author has therefore coined a term “Information Behaviour” which encompasses the ability to use electronic media coupled with the information management practices selected from Marchand and Kettinger (2002). Fostering this behaviour is a challenge that needs to be met, if organisations are to transform.

### **3.13 Conclusion**

In a fast changing world, organisations should (and in general do) plan strategically and revisit those plans constantly, and particularly plan for change. Strategic management may profit from using management techniques, but the level of formalism depends on the type of organisation. The implementation of strategic plans may imply a change in ways of operation – organisations might need to transform, often with a goal to respond faster and more flexibly to environmental changes. Approaches to achieving transformation are suggested. The potential of emergent strategies can be considered. Another approach would be for organisational and process restructuring. A change to more decentralised structures (which could be achieved through a network or matrix structure) is a possible route. A further approach is that of fostering a learning organisation which

is professed as providing more flexibility *inter alia*. This is tied closely in the literature to Knowledge Management. KM, and its subset CM, have an added potential to foster a unified culture that is better suited to a changing environment – an important feature in a changing organisation.

Thus the first part of the second sub-problem: “What management techniques are used to enable organisations to survive and flourish in the context of change?” has been explored, especially with respect to the techniques of the rational school of management, such as strategic management processes and techniques.

The approaches mentioned imply effective use of IS/ICT.

The second part of the second sub-problem: “How can IS/ICT support organisations in this context of change”, is answered by examining the literature on the importance of IS/ICT in the organisation, the information-importance in the organisation, the strategic management of the IT function as well as the alignment of IT to support the strategies and implementation of an organisation in a changing environment.

The inherent flexibility of IS/ICT is questioned. However, it is concluded that IS/ICT has the ability to change the way the organisations operate by leading the organisation into areas made possible by technology. Secondly, IS/ICT can support organisations in a state of flux by having plans closely aligned and constantly shifting to mirror the organisational strategies. The difficulty of SIPM is noted, but ideally it can enable provision of a flexible architecture to enable organisational flexibility. Part of the support IS/ICT provides is in the provision of information to support decentralised structures. Thirdly, the importance of IS/ICT-enabled KM and CM is put forward, and as a concomitant factor, the information behaviour of organisations. IS/ICT can support “softer” issues of transformation, such as support for better communications and the building of organisational culture when these are at issue. It can support the organisational knowledge management efforts where these are seen as important, as may be the case in South Africa at present.

The conclusion follows that IS/ICT can be a change agent, but that this is not a simple mechanistic linear relationship. Other factors are also at play, which need careful management. As Ellul and Postman noted (in Rodenacker, 1998), technical progress has three kinds of effects: desired, foreseen and unforeseen and the outcomes of the use of technology are “wildly unpredictable”. The goal of using technology for enabling transformation may thus be planned for, but the results may not always be what are desired!

The next chapter applies the conclusions from this discussion to the specific nature of HEIs.

## **Chapter 4 IS/ICT in HEIs**

### **4.1 Abstract**

This chapter examines the usage of IS/ICT at HEIs, and issues that are peculiar to HEIs. It reports on and draws from two surveys of IT Directors in SA to highlight areas that are relevant in SA. The role of Knowledge Management in HEIs is discussed. The chapter examines strategic management of the IT function, and specifically the extent of alignment of IS/ICT with strategic objectives. The role played by IS/ICT in the changing environment of HEIs is then explored. The chapter concludes by finding that IS/ICT can enable change, and this could be transformative change in the narrow as well as the wider definition of the word.

### **4.2 Introduction**

It is by now a cliché to say that HEIs are knowledge and information intensive organisations (Saberwhal and Kirs, 1994), and the importance of IS/ICT to support this type of organisation cannot be disputed. Indeed Mathieson (1994: 169), by example, states that computers “are deeply embedded in universities” and Foster and Hollowell (in Katz and Rudy, 1999: 9) write that “we have come to make IT an essential part of most of what we do”. There are, however, specific challenges that face HEIs in the use of IS/ICT, given their nature (as discussed previously).

This chapter explores the challenges of IS/ICT deployment in HEIs as reported by writers. The aspects where HEIs and other organisations differ are highlighted in this discussion. Features that are relevant to South Africa are examined. The chapter describes two surveys that were conducted in South Africa regarding issues (some strategic) facing SA IT Directors at HEIs. The information needs and knowledge management practices of HEIs are explored.



Of particular interest is the strategic management of IS/ICT in HEIs, and the alignment of IS/ICT strategies and business objectives, given the importance of this aspect in the business literature.

Finally, the aspect of supporting organisations, especially HEIs, in a state of change or transformation is discussed.

This chapter uses the discussion of the previous chapter and applies this to HEIs in order to explore the question posed as sub-problem four: “How can IS/ICT be managed strategically in HEIs in order to support transformation for HEIs to meet the challenges of the changing context”.

The chapter concludes that IS/ICT can be a change facilitator in HEIs provided that the specifics of HEIs are considered, and that strategic management and planning for change are engaged in, which would include Knowledge Management and Communications Management as facilitating change and innovation.

### **4.3 *HEIs and IS/ICT: status quo and challenges***

#### **4.3.1 Suspicion**

Doubts exist regarding the motives for the use of IS/ICT in organisations generally, and in HEIs particularly. The term technological determinism and digital capitalism are used in this respect. The use of instructional technology can be viewed as a way of sinisterly replacing labour in order to achieve efficiencies, where it is stated that it is easier to replace hardware or software than (tenured) professors. Then there is the suspicion that technology will cause changes that are undesirable, for instance changing work processes and organisational structures, and sidelining academics unable/unwilling to use technologies. Furthermore, the technical support required by technology has the effect of increasing that layer of staff in “techno support” (Minzberg, 1979) as courseware designers and support, multi-media specialists, library information specialists, and classroom support technicians (Massy, 1997; Metcalfe, 2006)

All these concerns are symptomatic of the changes occurring in Higher Education, where the advent of technology is changing the way core operations are conducted.

#### **4.3.2 SA Issues: two unpublished surveys (2003)**

Two surveys were conducted independently and coincidentally in South Africa in 2003 and 2004 to examine the strategic issues and concerns of IT Directors/Managers. These surveys are described in Appendix A with attendant averaged responses.

The first survey was conducted by the author. The survey consisted of questionnaires sent by email on a distribution list to IT Directors and managers of HEIs in South Africa. The survey requested information on the top IS/ICT issues concerning the responding institutions for 2003 and 2004. Next statistics on the existing resources were requested (ratios of staff, students, open computer laboratories, workstations and servers). Information regarding the budget and specifically the budget as a percentage of the total budget was requested. The existence and alignment of IT strategic plans was next questioned. Finally, the types of systems that existed to support the organisation were examined.

The second survey was conducted by Bosire (a past lecturer at the then East Cape Technikon) and again directed electronically to the IT Directors of HEIs in South Africa. The results of the Bosire survey (unpublished) were made available to the author. Some of the questions of this survey overlapped with those of the author. Bosire's survey asked similar question, such as "What are the top critical success factors for your institution?"; "What are the top challenges?"; "What opportunities do you see?"; "What services are mission critical?".

The results of the surveys are referred to in the course of this chapter. However, in summary, the main issues concerning IT Directors were mergers (understandably given the time of the survey), staffing levels (attraction and retention) and skills, security, budgetary and resource issues as well as affordability of IS/ICT, and top management buy-in. Services that were viewed as mission critical were email, Internet, and teaching

and research support, computer laboratory availability, student administration, and network reliability.

### **4.3.3 Government support**

Although State “interference” in HEIs is largely viewed with suspicion by academics as infringing on academic freedom, and financial State support for public HEIs is diminishing, welcome support exists for HEIs in IS/ICT. Government structures have been set up to support HEIs in their use of IS/ICT internationally.

One such structure is the Joint Information Steering Committee (JISC) in England. It comprises members of academics, senior managers, and technology experts. It appears to be unique in the range of support it provides to HEIs (as far as can be ascertained there is no such equivalent in the United States of America, nor Europe). It provides new environments for learning, teaching and research through (quoting extensively from their web information): Access to electronic resources; a world-class network – JANET; guidance on institutional change; and advisory and consultancy services (JISC, 2004).

It uses funding from a national funding council to provide the above and includes priorities for 2004-2006 as follows:

“Maintaining a world-class network infrastructure; Creating and maintain sustainable procurement and delivery services for online content; Developing a common, integrated information and communications environment; Creating managed learning environments (MLEs), linking virtual learning environments (VLEs) with MIS; Providing cost effective and user-led advisory and support services; Improving information and feedback mechanisms between JISC and its target audiences; Developing eResearch infrastructure and use; Helping institutions to manage investments in ICT; Providing a technology observatory role and robust evidence base of the benefits of ICT; Engaging with appropriate national and international organisations” (JISC, 2004).

In South Africa, TENET (Tertiary Education Network – see Appendix F) was founded in 2000 by the Committee of Technikon Principals and the South African Vice Chancellor’s Association (Tenet, 2005). These two bodies are represented by eight members on TENET. The purpose of the association is to secure services for “the management of

contracts with service providers, operational functions in support of service delivery; provision of other value added services” as needed. One of the main thrusts has been what is termed the “inter-campus connectivity” agreement with the then sole provider of telecommunications, to offer customised inter-campus connectivity solutions to institutions at the lowest possible price. The agreement is in place until 2006 (Martin, 2003; Tenet, 2005). TENET provides a subset of the JISC-type support.

The government has also instituted a task team to assist HEIs in the merger process. The responsibilities of the task team are to highlight areas for the institution in which expertise may be required, and provide assistance with their human resource issues, assess and advise on their ICT requirements and ICT implementation, advise on funding needs, and report to the Government’s Merger Unit (Bhagowat, 2005).

These services are of great value to HEIs and their IT Directors. It is suggested by the author that more could be done, in line with the functions of the JISC, in SA, and HEIs could benefit greatly through better cooperation and mutual learning facilitated by TENET.

#### **4.3.4 Importance of IS/ICT in HEIs**

Given that HEIs are information intensive, the question that arises is whether IS/ICT is positioned correctly. The importance or positioning of IS/ICT is characterised by factors such as the budget allocated to IS/ICT and the reporting structure for the IT Director (manager).

##### **4.3.4.1 Budget**

Both the author and Bosire’s surveys (Appendix A) mentioned the budget as an area of concern for IS/ICT in HEIs in SA.

The McCann, Christmass, Nicholson and Stuparich study (1998) state that 10% of total turnover is budgeted for ICT in the UK HEIs. The study suggests that too little money is invested by the Government and HEIs in IT. Green, in his campus surveys in the USA, notes that budget cuts are a continuing aspect of concern (Green, 2001, 2002, 2003)

although the 2005 survey indicates that campus IT budgets are improving. The Educause summary of 2005 supports this, noting central IT funding as \$2658 per FTE student in the USA on average as compared to the 2003 figure of \$1700 (Hawkins, Rudy and Madsen, 2003; 2005: 19).

Bosire (Bosire Survey, 2003 - Appendix A) finds budgets and affordability of IT as the most important factor. The author's survey (Roets Survey, 2003 – Appendix A) found that IT spend annually was averaged at R13.4m, but this is not a meaningful figure as IT Directors noted that they could only reflect their own budget and not the full IT expenditure for the institution, and that clarification was needed about the split in capital expenditure, running expenditure and staff expenditure, among others. In this survey, four (of the 13 responding) institutions responded to the budget question, and an average percentage of the IT annual expenditure was calculated from these responses as 5.2% as a percentage of organisational expenditure. This difficulty of quantifying the budget seems to be a general problem. Costs are “hidden” throughout the organisational budget, for example in departmental budgets, according to McClellan, Cruz, Metcalfe and Wagoner (in Metcalfe, 2006). The author's survey (Roets Survey, 2003 - Appendix A) highlighted the same difficulties in estimating the IT budget, as respondents stated that the budget is split by function (information management, technology etc), by category (running costs, capital expenditure), but also because components of the IT budget are allocated to academic and other departments. Foster and Hollowell (1999) argue that HEIs do not know how much they are spending on IT, because IT expenditure is incurred across different areas.

A questionnaire sent out later on the HEI IT Directors' group-email in SA by an IT Director was largely unanswered, and the reasons quoted were that it was difficult to quantify the budgets (as above), but also possibly that the information had a competitive value which IT Directors were unwilling to disclose.

#### 4.3.4.2 Reporting structure

Kanter (2002) notes (in his list of ten topics for 2002) the positioning of IT in the organisation as one of the key issues. Writers, amongst them Mathieson (1994: 170) and Darko-Ampem (1999), suggest that a high level post at Vice-Principal level should oversee all information resources. IT should be involved in institutional strategy and should be managed as a unit. The suggested norm for bigger institutions is a Vice-Principal of Information Management or IT, to whom a technical IT Manager, an IS Manager and the Library management report.

However, despite the avowed “high importance”, reality is slightly different. An Educause survey in the USA conducted in 2004 by Hawkins, Rudy and Madsen (2005), reports that there are many titles and many reporting lines for the highest ranking IT Administrator with 30% reporting to the Vice-Chancellor /president/CEO; 25% to the highest ranking academic; 24% to highest ranking administrative officer and 10% to highest ranking business officer (CFO). Katz and Salaway’s (2004) report notes that nearly 40% of IT Directors report to the CEO in HEIs in the USA, showing a change since Hawkins’ report, and that nearly 50% are on the executive management team. Hawkins *et al.* (2005), however, conclude that regardless of the reporting structure, what was important was whether the IT Director was represented on the “President’s Council” or not.

In addition, management of IT is often fragmented: Mathieson (1994) notes that management of IT in HEIs was a “patchwork” and Heiskanen, Assinen and Lindberg (2003) mention the problem of no central IT management. Information Management, Knowledge Management, Library Services, Telephony, Software, and Hardware and Networks can be managed by different individuals, reporting to different members of top management. Bernbom (1999) notes that the management of information is usually split between various functional areas: telecommunications managed separately from IT administration, this in turn separated from library services and instructional technology, while faculty and departments managed their own systems. Certainly until recently, before “convergence”, telephone systems were handled separately from IT. A previous

Educause summary (Hawkins *et al.*, 2003) shows a slightly different picture to the ideal suggested: for example, Library services report to the IT Director in only 15% of the cases. Lowendahl (2006) examines the structures with respect to power (budget for IT) and the fragmentation becomes greater. . His report suggests a process based approach with process teams that make IT decisions.

Not only does this split occur, but systems administrators and IT support staff are “hidden” in departments and units who do not report to the IT function. Hawkins *et al.*’s summary shows that for the institutions surveyed, academic/research computing, administration of the IT organisation, desktop support and training, IT Policy and security, network infrastructure, operations, telephony and web support usually fell under the IT Director; while the computer store, distance education, instructional technology, library, mailroom, multimedia services, copier services, and technology R&D did less often (Hawkins *et al.*, 2003) – see Figure 4-1 for percentages.

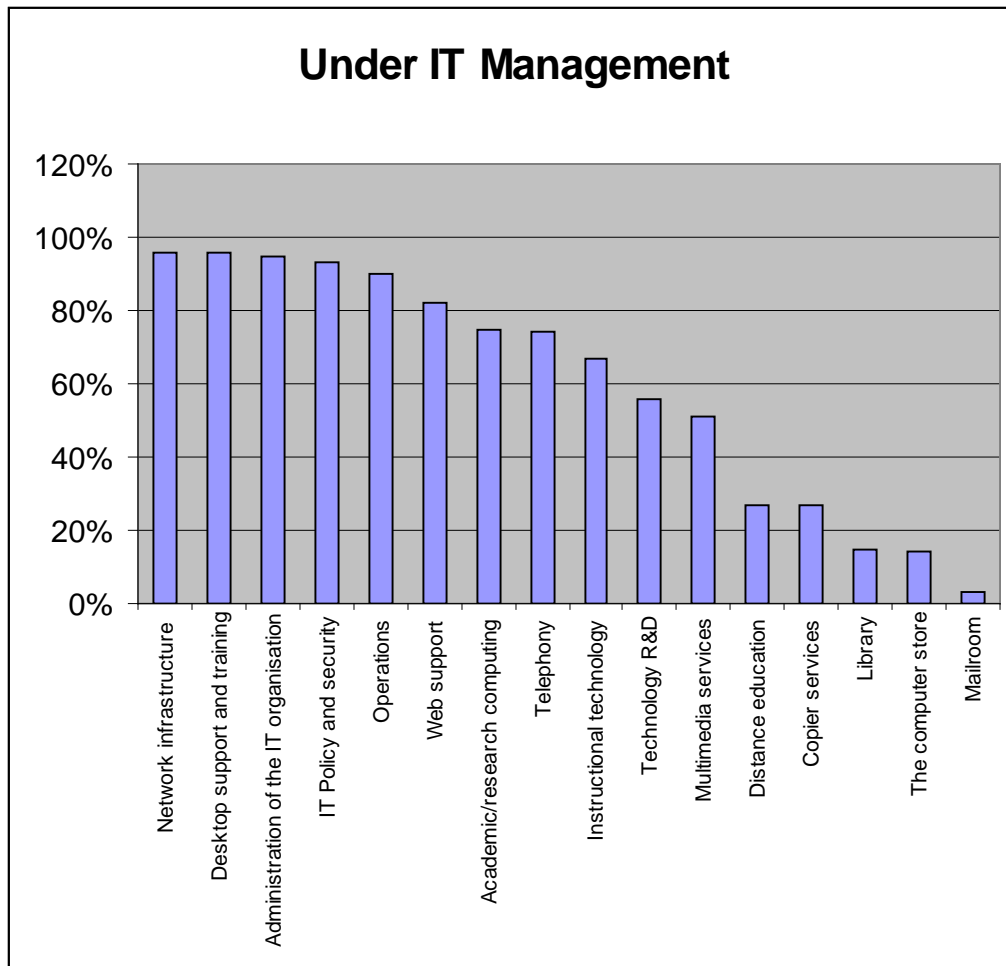


Figure 4-1 IT Management – Services - Hawkins *et al* (2003)

These splits often arise from historical, geographical or personality issues.

### 4.3.5 Governance and management

#### 4.3.5.1 Governance

“Governance” was mentioned as an important area for IT Directors in SA (Bosire Survey, 2003 – Appendix A). The term is used variously. Effective corporate governance implies accountability, responsibility, fairness, and transparency – the last of which has obvious implications for IS/ICT support. As regards IT governance, a study by Pirani



and Salaway (2004) reports that IT governance is viewed with dissatisfaction in HEIs: 56% of respondents agreed that their IT governance process was effective and only 45% said it was well understood. Foster and Hollowell (1999) argue that governance is to establish policy, and it does not have to do with implementation.

Writers agree that certain components need to be in place for effective IT governance.

#### ***4.3.5.1.1 Steering Committee***

One of the factors that may assist in good governance for IT in HEIs is the existence of steering committees. Writers have mentioned steering committees as being essential for the successful management of the IT function. The institution of a computer steering committee (to “provide strategic input for computing activities, to balance power and reduce conflict, allow wider involvement in policy and resource allocation issues while members are not involved in operational issues”) is a constant refrain for success (International Association of Universities, 2002; Wetherbe and Dock, 1978) .

However, Fielden and Simon (1997) state that the composition of such a group can also be a source of problems with either too technical, totally uninformed, or unstable membership.

#### ***4.3.5.1.2 Policies and Procedures***

Bernbom holds that an information policy is needed to guide/control the creation, storage, maintenance, use, access, preservation and of disposal of information (be it paper or electronic). There should be agreement about responsibilities for creation, maintenance, access, exchange and promotion of the view that data is a shared resource, and a view to integration (Bernbom, 1999).

Many universities have published their IT policies on the Internet. Some of the policies commonly contained are those for: proper use; identity misrepresentation, privacy and the need to access employee records, appropriate use of social security numbers, Internet IP addressing, domain name standards, electronic access to potentially offensive material,

copyrighted software, and property disposition. Service level agreements and disaster recovery plans may be included also.

#### ***4.3.5.1.3 Risk management***

Risk Management is a wider issue than just IT risk management, but should certainly incorporate IT risk management. Universities have published their risk management strategies on the Internet. One of those is the University of Georgia (University of Georgia), who mention the following: training of security awareness to staff and students; secure operations centre through security policy management, central audit log repository, deployment of vulnerability scanning; and developing policies such as disaster recovery, acceptable use of electronic resources, minimal security configuration, and incident response. Lowendahl (2006) lists seven risk factors (data integrity, availability of phone and research systems, IT roles and responsibilities and compliance to internal policies, IT skills, and the fact that IT infrastructure is not used by lecturers).

Green's 2005 campus computing survey (Green, 2005) indicates that the issue of greatest concern is network and data security (amongst surveyed HEIs in the USA). It notes that surprisingly only 57% of HEIs had disaster recovery plans in place; another issue perhaps unique to HEIs is highlighted in the survey: the need to control unauthorised distribution of digital content on the networks with 88% of the institutions reporting "appropriate use policies".

Writers argue that IT risk management should not be the purview of the IT Director, but should be planned for strategically at corporate level (Posthumus and von Solms, 2004).

#### **4.3.5.2 Management issues**

A report published by the HEFCE in the UK (Higher Education Funding Council of England (HEFCE), 1998) exemplifies management issues for HEIs as: "**permanent IS/IT strategy group steering**"; "retention of key IT staff"; appropriate training for staff and students"; "formal procedures to ensure effective service delivery"; "**internal audits are required to minimize risk and to maximize potential gains as well as ensure**

**compliance with service level agreements**”; “standardisation in procurement of IT for efficiency and cost saving”; “investment management through full investment analysis and investment appraisal techniques”; and the **“need to operate within a secure IT environment, in accordance with legislation”**.

The bold-typed items, in the author’s opinion, are governance items, while the remainder identify managerial issues.

Katz and Salaway’s research (2004) indicates that IT Directors in HEIs in the USA were reported to create an environment in which employees could speak freely, by 77% of respondents where the industry average is 47%. Respondent IT staff at all levels noted that they had opportunities to develop new skills (this was, however, not compared against the industry average). They also reported working long hours: 28% worked in excess of 50 hours per week.

#### ***4.3.5.2.1 Staffing***

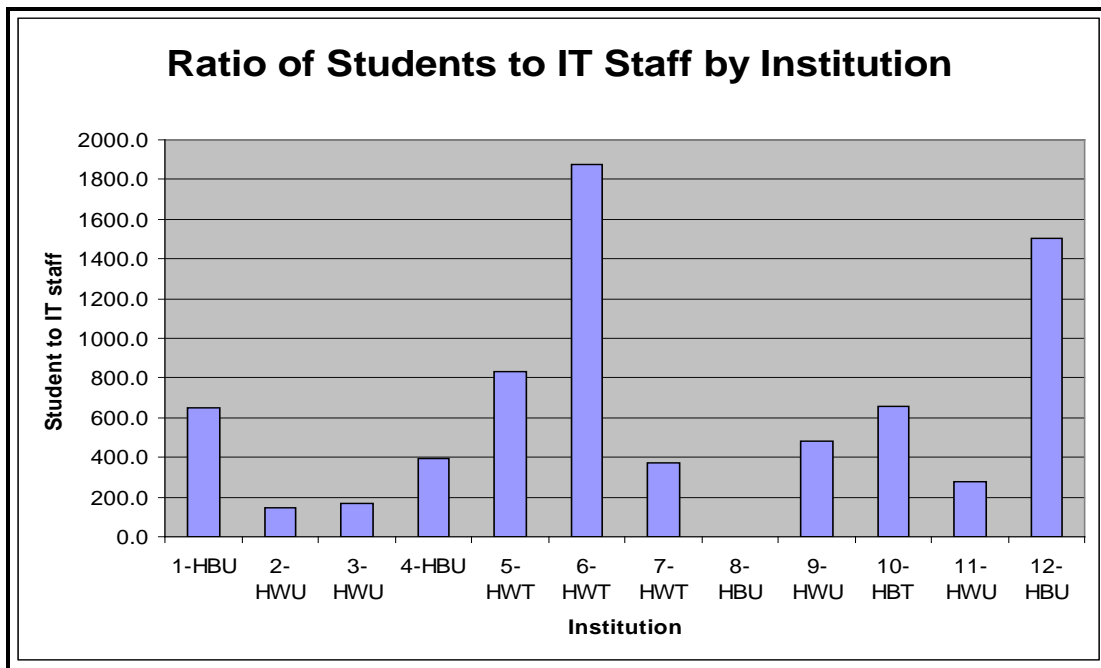
The IT function is reportedly chronically understaffed. The author attributes this to the marketability of the IT skills against the levels of University salaries. Green (2001) reported that hiring and retaining IT staff was an important issue, and his 2005 survey shows strong competition for skilled IT professionals. Heiskanen, Assinen and Lindberg (2003) state that IT departments are understaffed and development work is dependent on too few key people.

Katz and Salaway (2004: 4) state that IT Directors’ salaries are “holding up”, but that IT Directors are earning less at HEIs than in industry in the USA. They write that nearly 60% of the large sample surveyed earned more than \$100,000 per year, where the same level in industry would earn \$186,000 (in 2002). South African figures would be interesting.

In the author’s survey (Roets Survey, 2003– Appendix A), staff attraction and retention, competitive salaries and ICT skills shortage were issues of concern with staff attraction and retention seen as almost as important as affordability of IT. HEI salaries have not

kept pace with those of industry and certainly not with salaries offered globally. Thus retention of quality staff is a great concern.

Hawkins *et al.*'s survey (2003) showed that the largest percentage of "IT Staff" were in administrative systems (18%), user support (16%), and network and infrastructure (10%). The summary also shows an average ratio of 153 students to 1 central IT staff member. Not mentioned separately is the issue of IT staff who are part of departments. The South African ratios of students to IT staff by institution were elicited by the author's survey (Roets Survey, 2003– Appendix A) and are shown graphically in Figure 4-2, for each of the institutions who responded.



**Figure 4-2 Ratio of students to IT Staff – Roets (2003)**

(HWU = Historically White Universities; HBU = Historically Black Universities; HWT = Historically White Technikons; HBT = Historically Black Technikons)

Some institutions had very large ratios, pointing to staff shortages. Most of these compare poorly with the 153:1 mentioned in the Hawkins *et al.* report (2003). Generally,

the HBUs and Technikons (at the time) showed the highest ratios, with only one (an HWU) having a ratio below 153 (Institution 8 did not respond to this question).

Figure 4-3 shows the ratios of workstations to IT staff by institution.

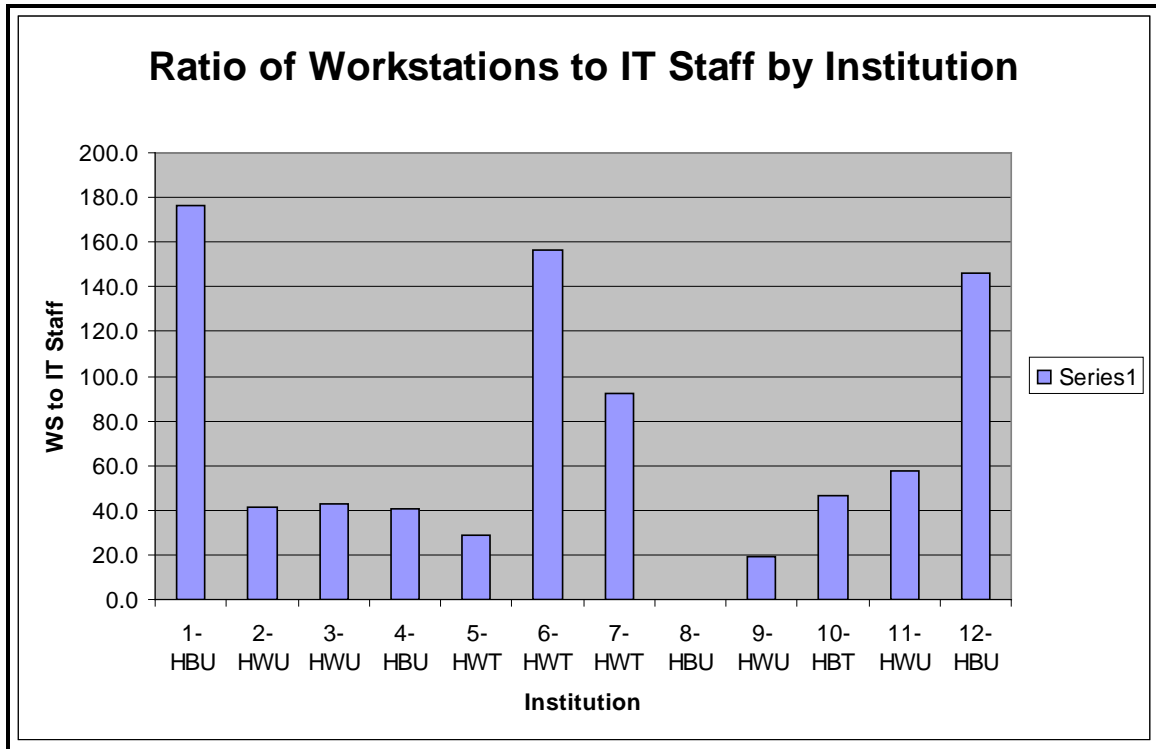


Figure 4-3 Workstations to IT Staff – Roets (2003)

This graph indicates the (im)balance between IT staff and workstations. It mimics the previous graph in indicating areas where the IT Division is short-staffed. (Institution 8 did not respond to this question). Ratios that exceed those of the previous graph, for example institution 1, point to a higher provision of workstations.

#### 4.3.5.2.2 IT cost benefit

The IT function in HEIs have not been immune to the need to cost justify the expense of IS/ICT. In the face of diminishing funding, questions are asked about the wisdom of huge outlays for equipment that has to be replaced every three or four years. The

sentiment that “the computer centre has replaced the library as academe’s bottomless pit” repeated by Fleit (1994: 7) is concerning.

#### ***4.3.5.2.3 Extra funding***

Innovative ways of generating funding have been sought. The obvious one is to charge students for usage. The McCann *et al.* study (1998) states that Australian universities are prohibited from charging students an extra levy on courses requiring computer access. The study suggests that as too little money is invested by the Government and HEIs in IT, innovative ways need to be found to fund IT. Another source of funding could be the charging of a technology fee, although other writers feel this is counter-productive. Greaves (2004) feels that it is pedagogically unsound, particularly with regard to Internet access, as students should be encouraged and not restricted in their use of the immense knowledge wealth on the Internet. The Educause summary (Hawkins *et al.*, 2003) states that charging a technology fee was reported for 52% of the institutions (on average) in the USA.

Foster and Hollowell (1999) recommend some “insourcing” possibilities. They mention the example of negotiating long distance telephone charges in bulk and selling this to students at a charge, thus recovering re-sale amounts while offering a service to students. They suggest that savings from the refining of processes, such as replacing labour and paper intensive processes should be allocated to technology renewal. The Educause summary by Hawkins *et al.* (2003) notes that income is received from the sale of central services to internal and external customers, as well as from resale of products.

There is not much doubt that battling for IS/ICT resources is ongoing and that a debate on IT value is needed. The solution will not come from Government funding, and innovative ways need to be found to fund this necessary resource. At the same time, for Universities who are dealing with poor students, the solution cannot be to raise funds from the students.

#### ***4.3.5.2.4 South African specifics***

In South Africa, the laws governing appointments affect HEIs and IT divisions also. Diversity management was mentioned as an issue in Bosire's survey (Bosire Survey, 2003 - Appendix A), a factor certainly not unique to either IT or HEIs, but nevertheless worthy of mention.

The provision of IT at HEIs as reported above is important, as the equalising of resources is required, especially in merged institutions. This has major cost implications.

### **4.3.6 IT Resources - hardware and technology**

Specific concerns regarding the IT infrastructure that are pertinent to HEIs are discussed in the following sections, such as cost of technology, hardware provision, network challenges and new technologies.

#### **4.3.6.1 Cost and replacement**

Given the concern regarding the IT budget, it is not surprising that issues specifically regarding hardware infrastructure are raised as concerns: Financing replacement of ageing equipment was the fifth ranking issue in the survey of IT campus issues (Green, 2001). The rapid change of technology is a continuing risk: connection costs are also expensive, particularly in developing countries. Venter notes that bandwidth is so expensive "that most universities could not afford more than 1.5MBps" (Venter, 2003: 2). Foster and Hollowell (1999) suggest a three-to-four year planning cycle for replacement of desktop equipment, echoed by Hawkins *et al.*'s report (2003) showing that 60% of institutions surveyed have between 3 and 4 year replacement cycles for campus computers.

In developing countries (and South Africa), since most technology, especially hardware and communications technology, is imported, the costs for these countries are considerably more given exchange rates and import duties. While the cost of hardware came down dramatically and IT was seen as becoming more affordable everywhere in the

early 1990s, the cost of networking, software and support has risen and has offset the savings.

#### **4.3.6.2 Provision of technology**

In HEIs, public facilities exist: Kiosks for students to access email are available throughout campuses, and wireless communications have also aided in making email ubiquitous; some residences are wired for access; open laboratories exist for open or restricted usage; and departments “possess” course specific laboratories. The required level of technology provision in terms of open laboratories, workstations for staff and students, wireless networking points, access to the network and Internet, and bandwidth speeds to quote a few, may possibly be set strategically, but is otherwise driven by the IT Director.

Benchmarks exist for the ideal ratios of computers to students and staff. The Dearing report (Department of Education: United Kingdom (DfEE), 1998) states that in England the average of students to networked computers is 15:1. A target of 5:1 is envisaged. The report recommends that greater student ownership of computers should be fostered. This statistic is borne out by, for example, the University of Essex, where in 1998 the ratio was 24:1 excluding departmental facilities (University of Essex), and if these were to be included, the ratio would be about 8.5:1. In North America, students are required by some institutions to have their own laptops. Whether required or not, many have their own. Financial aid is often available to ensure help for students who cannot afford this (Woods, 2003). The Dearing report (1998) further suggests that by 2001 students should have access to computers that are networked, and further envisaged that by 2006 all students would be required to have access to their own portable computers. According to Fice (personal email communication, 2007) the changes are epitomised for example by the University of Surrey where the University has moved from providing computers to providing the networks and connectivity to allow students to use their own personal computers( laptops mostly) to access services locally or remotely. The

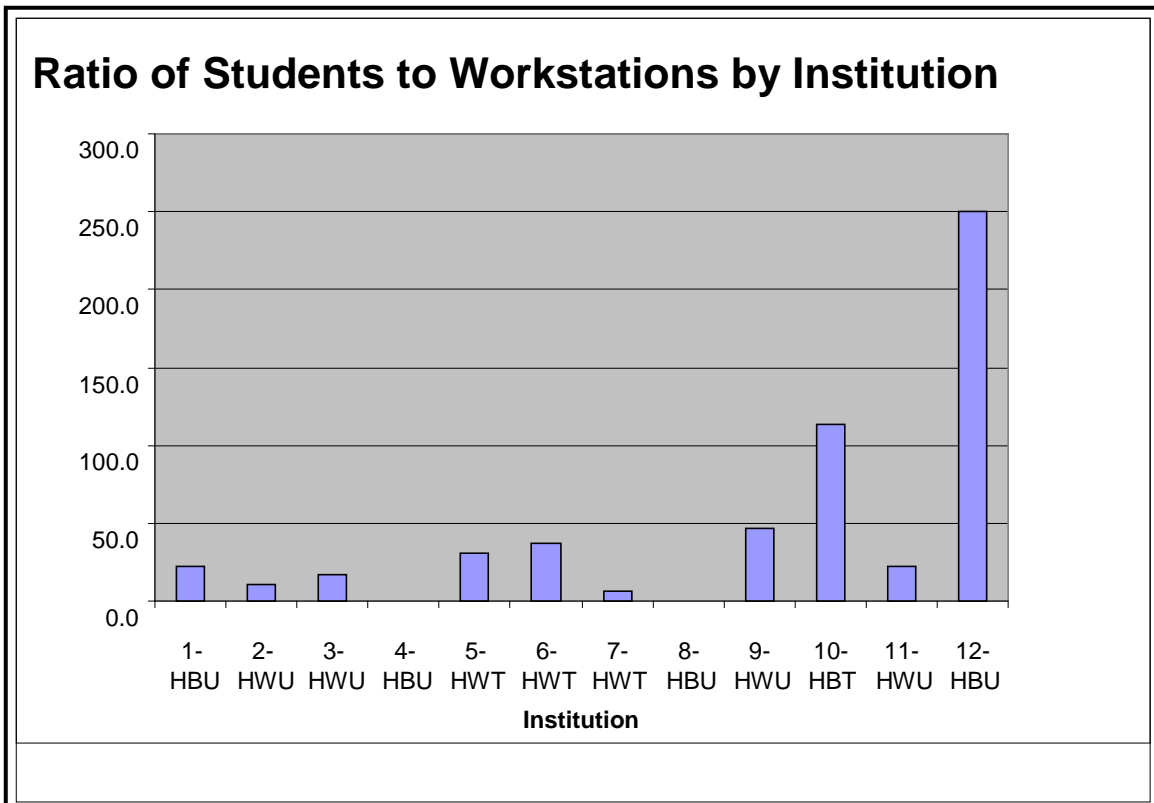


provision of “Hot-spots” is also becoming a norm. This is less likely and possibly problematic in developing countries.

Email and web connectivity is almost a given. In the United States, Universities have an 80% connectivity to the web compared to 39% of the overall population according to Looney and Lyman (2000), although a report on Internet statistics worldwide shows North America overall as having 68% Internet usage in 2005 (World Internet usage statistics and population stats). Connectivity and usage may be two different issues. In Australia, McCann *et al.*'s study (1998) provides “crude” statistics for Australia: on-campus students had 40% connectivity, but this is set to rise to 80% by 2003. The study mentions that rural students could be at a disadvantage.

This is of course particularly pertinent in South Africa where the number of rural students is large, and the type of access mentioned is not necessarily the norm in developing countries. An International Association of Universities report (IAU, 2004) notes that in 2001, 80% of the 120 Universities approached internationally stated that nearly all teachers have email access, but only 55% have the same coverage for students. The report cautions that the institutions answering were probably those with experience in ICT (International Association of Universities, 2004).

The author's SA survey (Roets Survey, 2003 – Appendix A) resulted in the following graph (Figure 4-4), showing the ratios of students to laboratory workstations by responding institutions.



**Figure 4-4 Ratio of students to workstations - Roets (2003)**

As can be seen from this graph, some of the ratios approach the norms as suggested by the Dearing report of 5:1 and 10:1. Others are very high. Some of the respondents did not furnish the number of workstations that were available – hence the gaps (neither Institution 4 nor 8 responded to this question). The HWUs had predominantly the better ratios.

**4.3.6.3 Network resilience and bandwidth**

Peebles, Antlovic, Holland, Adams, Allmayer and Davidson (in Katz and Rudy, 1999) note several changes that add complexity: complexity of the environment in terms of operating systems and hardware; the network environment has become more complex - according to Green’s 2005 survey there is a continuing expansion of wireless networking while the growth in number of users has been exponential.: nearly 30% report full

campus wireless networks in place, and wireless classrooms from 26% to 53%.

Convergence and a legal environment have increased complexity; the growth in number of users has been exponential, and network infrastructure and security are issues of concern. Writers mention the importance of network resilience and backup as risk management has increased in importance (Green, 2001, 2003; Fice, 2003; Kanter, 2002).

In developing countries, the national telecommunication bandwidth is limited.

Rodenacker (1998: 119) quotes the FRD report which states that the University network in South Africa (at the time, Uninet) was congested all year. The budget for the network was also low: in Brazil, \$40 million was spent in 1995, while in the same year the Uninet budget was < \$3.5million. Although this has increased to \$7.7 million, it is maintained that this is less than 25% of what is needed. Connection costs are also a major difference for developing countries. An IT Director (ITMgm, 2003) stated that to his knowledge, a specific HWU has been quoted as paying the equivalent of \$135K per annum for Internet connection, while an American University would pay a fraction of this for 12 times the bandwidth.

### **4.3.7 Application systems and software**

#### **4.3.7.1 Software acquisition and replacement**

As for hardware, replacement of software systems is also viewed as an important issue. Of the IT campus issues in the USA mentioned in Green's survey in 2001 (Green, 2001), upgrading or replacing administration systems ranked third. The acquisition or replacement of systems has also been highlighted as a concern for IT Directors in the UK (Fice, 2003). The decision on whether to use home-grown systems, purchase an ERP, or use a mix of the two approaches is a significant decision, involving a large expenditure, and has far-reaching consequences.

#### **4.3.7.2 Specific software provision for HEIs**

According to Green's 2005 campus survey, the number of applications demanded at HEIs have increased (to a few hundred for one quoted HEI); there has been a concomitant

demand for user support and a greater demand for customer centric services and value for money from stakeholders (Green, 2005).

Petrides and Nguyen (in Metcalfe, 2006) note that the IT infrastructure at many HEIs is “problematic”, where several systems supporting various functions exist and include legacy systems throughout the institution. They, Petrides and Nguyen in Metcalfe (2006: 28), mention unreliable data collection priorities leading to unreliable data. They also mention problems of independent data silos, “redundant data gathering” and data “hoarding”.

The types of application systems used in HEIs are somewhat different to business organisations in that they support functions and processes of HEIs that are peculiar to these types of organisations (Lancaster and Strouble, 1992). However, Foster and Hollowell (1999) write that HEIs have not done a good job in providing even basic administrative support services such as registration and financial aid billing. Although systems exist in HEIs for administration, they provide less support for management (Gueissaz, 2002). By contrast, the summary by Hawkins *et al* (2003) shows that 99% of HEIs in the USA have Student Information Systems; 99% have Financial Systems; 95% have HR Systems; 89% have Library Systems; 94% have Course Management Systems and 40% have Grant Management Systems.

The six areas that require successful support by IS/ICT are shown by the IAU survey (International Association of Universities, 2002) to be (i) teaching and learning; (ii) student affairs and services; (iii) administration, (iv) libraries, (v) open and distance learning; and (vi) research. No mention is made of support for academic management.

#### ***4.3.7.2.1 Teaching and learning (and open or distance learning)***

Paterson (2004) writes that the new technology environment has changed the focus of the use of IS/ICT from administrative/operational efficiency to a search for ways to use IS/ICT for different forms of support for different types of teaching and learning, especially more flexible teaching and learning. Green (2001; 2002) states that in the 2002 Campus IT issues survey, an important issue was to assist with eLearning.

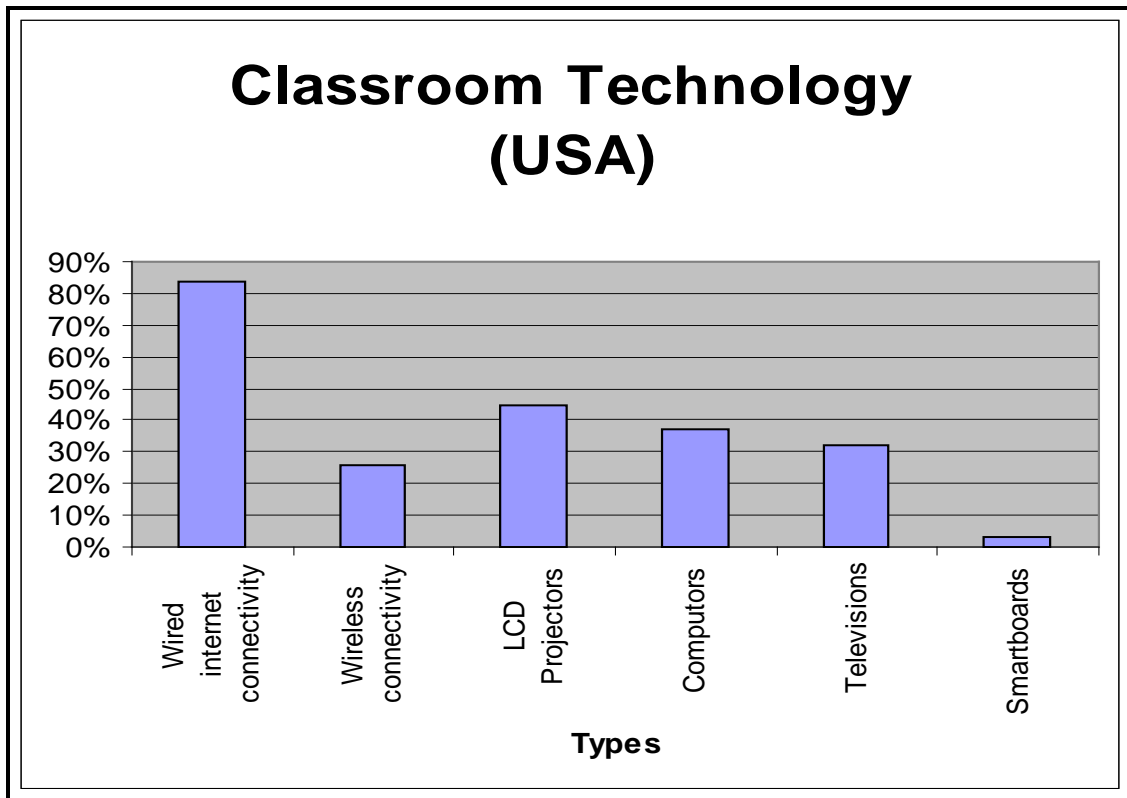
New teaching and learning technologies are changing the way HEIs approach knowledge transfer or sharing. Salmi (2001: 110) notes that ICTs support the fact that learning is based on the “capacity to find, access and apply knowledge to problem-solving”.

Massey University (in New Zealand), for example, as part of its strategy has the aim to “strengthen our flexible learning and teaching focus to integrate new technologies into course delivery for both internal and external students” (Massey University, Website).

The use of email and the web have important implications for teaching and learning.

Lancaster and Strouble (1992) mention the use of email to improve communication between lecturers and students to enhance teaching, and the Internet facilitates research collaboration. Much attention is being focused on the issues of face-to-face, blended, on-line and distance education through the support of IS/ICT. In South Africa, a recent eMerge 2004 conference was an example of an on-line conference with a focus on eLearning, and the interest was such that the conference is being reconvened for 2006. Yanosky, Harris and Zastrocky (2004: 1) state that eLearning “will still be the richest source of IT innovation in the next five years”.

The provision of technology in classrooms is becoming the norm although this is often a problematic area, as not every lecturer is able to cope with the connecting and technical set ups required to use these without support. This is especially so for the more senior lecturers (generally age-related), who find that technology “gets in the way”. Langlois (1997) notes certain threats and limitations posed by ICT usage for HEIs. ICT literacy of teachers is a problem, and academics are not prepared to use ICT in classes. The rewards for doing so are limited, considering the amount of time required to get to grips with technology. The summary by Hawkins *et al.* (2003) reports that 84% of classrooms have wired Internet connectivity, 26% wireless, 45% have LCD projectors, 37% have computers, 32% have televisions, and 3% have smart boards in the USA – see Figure 4-5.



**Figure 4-5 Classroom Technology in HEIs (USA) - Hawkins (2003)**

It would be interesting to do a comparison with SA HEIs. The case studies that follow comment on this issue for the specific HEIs in SA.

In developing countries, the cost of such teaching technology (such as data projectors) is again a stumbling block. However, despite the initial costs of ICT, in the long term it does prove cost effective for use in HEIs (International Association of Universities, 2002): the cost of an Open University graduate is one third the cost of that of a “normal” university – presumably because of the displacement of teaching staff costs. An HEI in the UK maintains that “Information systems can help counteract pressure on staff, by enabling flexibility in time and place, speeding up processes and displacing tasks to enable staff to use their time more fruitfully” (University of Essex, webpage). McCann *et al.* (1998), supported by Grant and Anderson (2002), state that significant savings can

be made by lecture halls and libraries becoming virtual, and administration services being offered electronically.

According to Allen and Fifield (1999), a search for greater efficiency and effectiveness is required as the old lecturer- students ratios, and therefore interaction, no longer apply so learning needs to change. HEIs are experiencing pressure to change their collegial tutor driven style of interaction with students and IS/ICT, may offer an answer.

The summary report by Hawkins *et al.* (2003) states that 70% of institutions surveyed in the USA had specific e-learning centres, 52% had a faculty/teaching centre working with IT, 54% had instructional designers working with technologists, 50% had intensive support for faculty using technology and 91% had faculty on-request training. On a negative note, individualising the learning process can also run the risk of leading to a loss of socialisation (Lund, 1998).

Paterson (2004) writes that the Internet and web technologies have opened up opportunities for blended or on-line learning. He notes that HEIs in SA who use IS/ICT for enriched and different forms of learning need to ensure that access is possible by all (in pursuit of redress and equitability). Broekman, Enslin and Pendlebury (2002) discuss issues of social justice in web-based learning in SA, where a majority of the students do not have access to the Internet except at the place of study, and the authors question whether this is fair. HEIs in South Africa are giving eLearning serious attention.

The eLearning support system widely used in SA is WebCT<sup>®</sup> (which has all the functionality required of an eLearning system – publishing of course material, electronic interaction with students, and classroom management, amongst others), although some Universities have discarded WebCT<sup>®</sup> because of cost, and Open Source Systems (OSS) are starting to be used also (KEWL, Moodle and the SAKAI project are examples). The use of WebCT<sup>®</sup> or other such software seems to be driven from the bottom-up in SA, in the author's view, but this statement needs substantiation.

#### 4.3.7.2.2 Student affairs and services

Student management is an aspect of HEIs that is not a “normal” business process. However, this is a critical area for HEIs, especially if the student is seen strategically as a “customer”. McClellan *et al.* (in Metcalfe, 2006) quote Karns, stating that students have become more informed, and demand levels of service from the University that they would receive from other organisations.

Grant and Anderson (2002) contend that the current trend in HEIs is shifting to concentrating on customers. This is relevant to IS/ICT support in terms of Customer Relationship Management (CRM), although other writers may argue that this is not the case. Grant and Anderson state that CRM gives benefits of better recruitment and retention, reduced recruitment costs, and improved customer service. Similarly, Englert and King (2002) in a Powerpoint presentation, define CRM features as focusing on attracting, serving and retaining the right customers to help an institution prosper. According to Englert and King, CRM systems support these goals by increasing the number of high value customers and increasing sales to them, and by extending the length of the relationship, thus resulting in profitable “relationship equity”. CRM affects campuses in processes and systems such as enrolment management, recruiting and prospecting relationships, alumni “friend-raising”, campaign management, distance learning, alumni networking, legacies, marketing and managing continuing education, and grant preparation, amongst others. Typical systems are listed in Table 4-1, mostly garnered from Green’s list (2001, 2002), as well Bosire’s survey (Bosire Survey, 2003 – Appendix A):

<b>Typical Systems</b>	
<b>Student Management</b>	<b>Comments</b>
Undergraduate applications	
Student admissions	
Financial aid applications	
Course catalogues	



Online and course registration	> 70% of HEIs in the USA used this (Green, 2002)
Barcode swiping for re-registration	Implemented at some institutions in the UK (Fice, 2003)
Online courses	
Course reserves	
Student transcripts	
eCommerce for fee payments	11% had a strategic plan for eCommerce (USA, Green, 2002)
Processing credit card payments from the campus web site	More than 40% of HEIs have this function (USA, Green, 2002)
Accommodation	
College book store services	

**Table 4-1 Student services**

Foster and Hollowell (1999) concede that new on-line services allow students to help themselves better. Smith and Sutherland (2001) report that online registration is not universally available although most HEIs have plans in that direction.

Much attention has been devoted to the use of the web and portals to deliver systems and services to students and to reengineer the relevant processes (Green, 2001, 2002, 2003; Kanter, 2002; Fice, 2003). Green (2002) reports 21% of HEIs in USA have a portal functioning. Only 30% do not have any portal plans.

Not only can portals provide a better, focused, service for students, but this type of service allows the burden of the work to shift to students. This could be a reengineering process that could be an HR cost saving – less staff required in the student service unit. Any mention of downsizing is fraught in SA, where there is a conscious attempt to increase employment, and any staff reductions have to be negotiated with the trade unions.

A reported disadvantage of portals is that they may shift the burden of work to faculty, thus increasing the load on the professionals. Some of the functionality and student services offered may be more than needed or wanted by students, and viewed as technology-led rather than demand-led, and thus not cost-effective. Further problems with portals include the ownership, design and quality of the content posted, the skills needed to create them and thus the cost, the difficulty to keep sites fresh, and the responsibility for effective maintenance (Looney and Lyman, 2000).

#### ***4.3.7.2.3 Administration***

The Support units/Administration units need software not very different from any other organisations. Financial systems are required, HR systems, estate and asset management, and marketing are modules typically found in ERP systems. The systems that are unique are, of course, student administration, and government statistical reporting systems. The Table 4-2 (gathered from writers, websites and the author's experience) lists typical administrative systems, with comments on some of the systems.

<b>Typical Systems</b>	
<b>Administrative Systems</b>	<b>Comments</b>
General record systems	
Financial systems for procurement	
<i>Fundraising</i>	Donovan (1992) reports tracking usage, externally for claiming funding and internally for “funny money” budgeting
<i>Human resource systems including payroll.</i>	Very flexible employment practices for faculty and students is atypical for other organisations
Purchasing	
<i>State regulatory statistical systems</i>	
Management accounting and grant management systems	Grant management is atypical for business organisations
<i>Recruitment management</i>	
<i>Marketing, alumni and PRO systems</i>	
Integrated estates management	
Asset management	
Inventory management	
Maintenance	

**Table 4-2 Administrative systems**

The italicised items are systems that may differ normally from usual business systems.

Human Resource management systems need to be more flexible than normal systems allow, and grant management and fund management may also be fairly unique. As noted above, there is doubt expressed by writers that these systems are being used successfully. Fielden and Simon (1997) mention specific examples of possible efficiency gains from use of IS/ICT for administration: replacing the need for two signatures by an electronic notification; procurement where duplication of paperwork can be eliminated; and a procurement card program that is web-based for account charge reconciliation. Some universities use the web to replace previous processes totally and encourage use through, for example, discounts (Englert, 2003). A study by Allen and Fifield (1999: 4) notes that the “culture of individualism” is a main stumbling block for radical BPR initiatives, but concludes that modest efficiency gains may be achieved through BPR, particularly for administrative systems.

The lack of academic management support has been mentioned. Departments and individuals run a variety of systems such as spreadsheets and databases, which are totally decentralised, to manage the courses. Theoretically this is not a good course of action: systems need to “speak to each other” to avoid redundancy and replication errors. Kelly and Roberts (2000) write that eLearning needs also to focus on the management aspects of course delivery, such as registration, finances, publication of results, security and privacy and integration with existing systems.

Typical academic systems culled from literature are listed in Table 4-3:

<b>Typical Systems</b>	
<b>Academic and Faculty support</b>	<b>Authors</b>
Instructional software	
Room booking systems	(Phillips and Browning, 2001)
Timetabling	
Course management systems	The 2001 survey by Green made special mention of this – ranked as an important issue (Green, 2001).
System to assess applicants' academic risk profile	Making this available to faculty and administration in order to monitor the applicants' success longitudinally, as well as to indicate interventions to improve their chances of passing (Koch, Foxcroft, Watson, Seymour and Streicher, 2002).

**Table 4-3 Typical Academic systems**

Course management systems appear to be most problematic (the 40% provision quoted earlier). In SA, this was underscored when a student development project for departmental administration (Project Firefly, 2003) was demonstrated at a national competition, and was eagerly requested by several of the academics there.

#### ***4.3.7.2.4 Libraries***

Libraries have changed, perhaps the most dramatically, through the use of information technology. On-line catalogues are the norm at most HEIs as are electronic databases, eJournals and search facilities. These are not necessarily less expensive, but have changed the way students/researchers are able to access text material. Virtual libraries are almost essential in developing countries, since holdings of printed material are often minimal. Magrath (2000) writes that collaboration between wealthier and poorer Universities (global collaboration) could be even more beneficial in this respect.

In South Africa, the SEALS project (South East Academic Library Systems) is an example of regional cooperation of HEIs in the Eastern Cape, whereby cost savings are

made through sharing software, as in the software for circulation and acquisitions, and also OPAC, the public access catalogue that records the holdings of all the libraries. External funding was obtained to set this up.

#### **4.3.7.2.5 Research**

Research too has been transformed through the use of communication technology. This is partly through the access provided by eLibraries. Additionally, technology has the ability to foster collaboration beyond the scope of the individual institution much more easily. Lancaster and Strouble (1992) mention the use of the Internet which facilitates research collaboration. Networks like SuperJanet (England) and TENET (SA) are provided for this specific goal.

Tolmi (2005) notes that IT could be used profitably to support research.

“ A system that could be of great value to a university is an organisation-wide research administration system that would host all the research related information, e.g. research interests, research results, publications and possibilities of research funding, proposal-routing policies and procedures, patent information, possible commercialization opportunities, etc. (adapted from Kidwell *et al.* (2000). If such a system supports different access levels depending on the role of a user (e.g. lecturer, departmental chairperson, dean, research director, etc) and provides relevant functionalities (e.g. search facilities, document sharing, etc) it would be a powerful knowledge management tool that would enable:

- Better research administration
- Sharing research results and best practices across the whole university
- Searching for possible research partners in other disciplines
- Identifying common research interest for focusing purposes
- Searching for possible commercialisation opportunities
- Hosting communities of practice
- Yield management information as needed”.

Potentially more interesting in the ongoing debate is the issue of institutional repositories. Paulus (2004) reports that although interest is high for institutions to build up repositories of teaching and research related work, not a great deal has been built up yet and publishers are not yet “quaking in their boots”. However, publishers are obviously not entirely in favour of the move towards open access. As reported by Wray (2004) in the Guardian Newspaper, the chief executive of Reed Elsevier believes that it "could jeopardise the stable, scalable and affordable system of publishing that currently exists". According to Wray (2004) even Reed are "making some concessions", however, "alongside the rise of open access publishers...some academics are pushing for the right to place copies of articles they write for subscription journals on their own websites. Reed has changed its copyright rules to allow self archiving in this way". Research publication management systems are necessary to support this function.

#### **4.3.7.3 General software acquisition or development**

Upgrading or replacing systems is an important decision. Legacy systems exist, and decisions have to be made regarding keeping or phasing them out, doing in-house development, and acquiring packages or ERP systems. These are all long-term decisions. Institutions have made use of consultants and outsourced part of the IT function, while others have built in-house skills. Procurement of systems is a problem, as Fielden and Simon (1997) note that project teams in HEIs often have less experience in the rigour required for the process, given the low frequency of procurement cycles in HEIs. Implementation plans are often not produced.

In 1992, Lancaster and Strouble (1992) stated that HEIs were often locked into “mainframe” or legacy systems that had been developed in-house a long time previously, but that packaged software was becoming available to cope with the peculiarities of HEI administration not previously catered for in “normal” packaged software. By contrast, in 1997, Fielden and Simon (1997) stated that less than 50% of applications were packaged software. However, Hawkins *et al.* (2003) reported on the acquisition of systems and found 53% (on average) reported developing systems in-house, 64% purchased products

without change, 70% purchased packages and introduced changes, 40% bought “best of breed” products; 54% bought integrated packages, while 7% outsourced administrative systems (many used a combination of strategies, thus a sum > 100%) as shown in Figure 4-6.

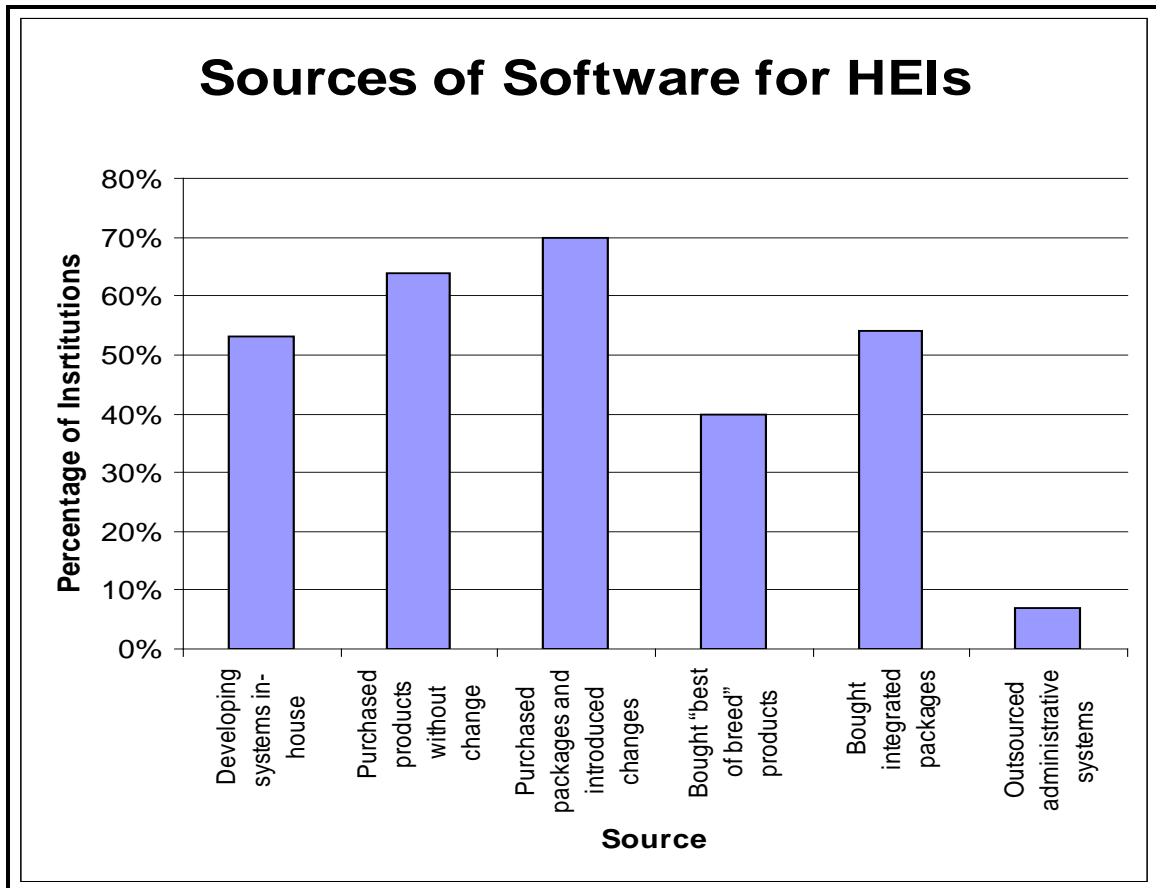


Figure 4-6 Sources of Software at HEIs - Hawkins (2003)

Three particular sets of software are under review by HEIs, namely Open source applications (mostly for e-Learning as discussed in 4.3.7.2.1), ERP systems and Web portals. The latter has already been mentioned under student services, but usage is wider than that.



#### ***4.3.7.3.1 Open source applications***

HEIs have also employed open source software. Gleason (2003) notes that numerous HEIs are investigating non-commercial software as a possible alternative to proprietary software. Gleason, however, also mentions HEI inertia which militates against change: he uses the example of certain word processing packages whose usage becomes entrenched. A trade-off exists in that this open source software is more flexible and less costly, but requires greater skill to employ and maintain. Systems software is more readily accepted, for example, Linux and Apache. Application software is less widely used. Financial applications, for example, are not much used and viewed with suspicion. Some of the criticisms of open source are the lack of support and training for the software. Gleason answers one of the arguments regarding support by stating that sustainability is possible because of cooperation with commercial companies. He is of the opinion that student systems vary greatly in scope and customisation, but financial systems are standard and are a prime example for open systems to be developed. Phillips and Browning (2001) refer to freeware used for search engines, timetabling and room booking systems as significant applications for effective cost management of resources. Gleason mentions uPortal software as an example of a successful portal engine. In South Africa, the Shuttleworth Foundation is encouraging the use of Open Source Software in HEIs, by the donation of computer laboratories in which only open source applications and software are to be used. However, the fact that most IT Departments are stretched thinly, and that open source software is reputed to be support-hungry, militates against the extensive use of open source applications in South Africa.

#### ***ERP systems***

The move from legacy systems to ERP systems has been slow. This is partly because HEIs have unique system needs as discussed above. The cost of ERP systems could be another reason. Swartz and Orgill (2001: 20) note that “universities often spend in

excess of \$20 million” to implement ERPs projects and show mixed results of success. They categorise the costs as shown in Figure 4-7:

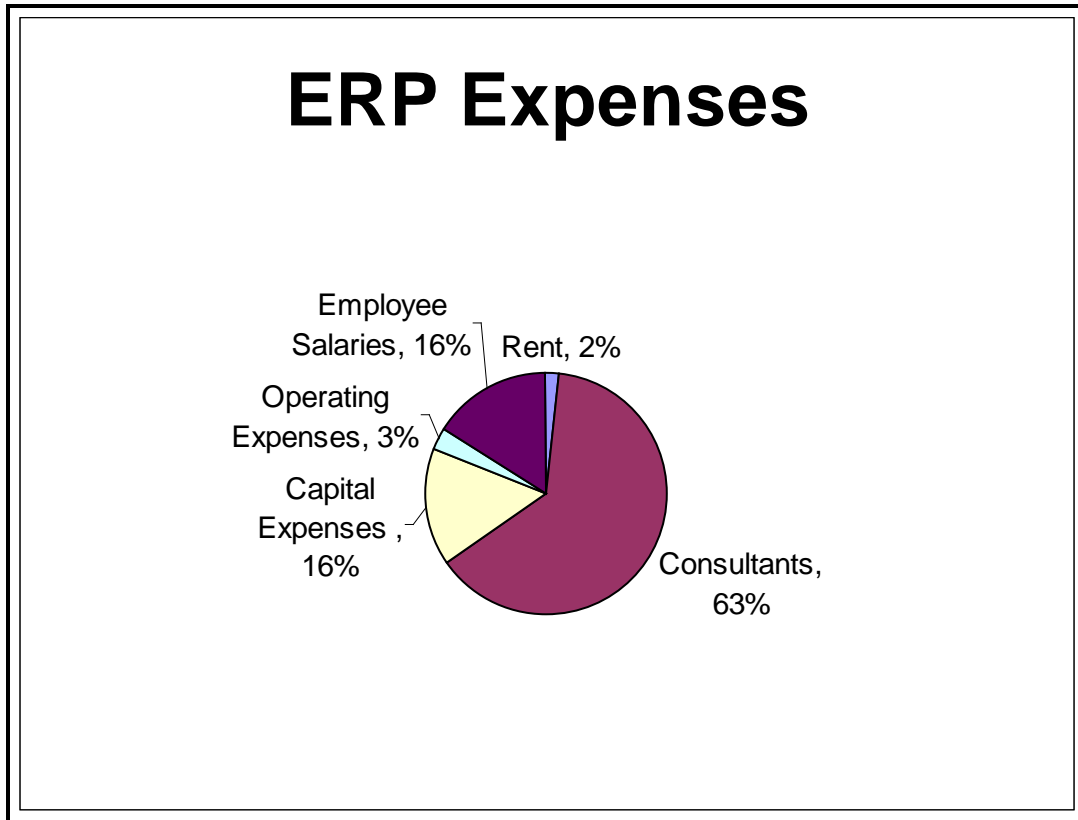


Figure 4-7 ERP Expenses - Swartz and Orgill (2001)

The cost of consultants is a huge proportion of the total cost.

As Savage (2003) stated in Chapter three, organisations in SA are small by world standards, “and the scale of business is not big enough to justify the investment that is made in IS/ICT by global organisations”. This would hold for HEIs also. However, by 2001, ERPs were reportedly widely used in HEIs internationally (Swartz and Orgill, 2001). Overmeyer (2003) maintains that “the trend in both the States and NZ (administratively) is to move toward ERPs for student records, registration, and administrative support services. Most choose some commercial-off-the-shelf system (for example, Banner), but others opt for in-house development”.

ERP systems in HEIs have had mixed results. ERP systems are costly, and their introduction has not been totally devoid of problems either. Swartz and Orgill (2001) note the risk of adapting to perhaps outdated or inefficient business processes. The study by Scott and Wagner (2003: 297) on the implementation of an ERP system in a university reports that two years after introduction, the old and new systems were still coexisting and the new system could still not answer faculties' most commonly asked question: "how much money do I have left to spend?".

Development or tailoring of ERP systems is often outsourced. Scott and Wagner (2003) mention the case where the Vice-Principal (VP) in charge of IT broke from tradition by choosing an industry partner rather than align with "a diffuse network of grass roots development expertise".

In South Africa, the survey by the author (Roets Survey, 2003 - Appendix A), noted that administrative systems were causing concern. For administrative and learning support, HEIs have either legacy systems, ERP systems (one of which is a locally developed system – Integrated Tertiary Software (ITS<sup>®</sup>) – which supports the typical HEI administrative functions), or a mix of the two. The ITS<sup>®</sup> system was originally designed for "Technikons", now Universities of Technology, and many of these have installed modules of the system. Some Universities have adopted ITS<sup>®</sup> also, although it seems less suited to the more diverse/complex nature of Universities. One HEI decided against ITS<sup>®</sup> on the grounds that it is expensive and does not have the required functionality (McNamara, 2001). The same HEI is a beta site for SAP<sup>®</sup>, which requires a great deal of support, according to McNamara. However, fund management is a unique system not catered for in SAP<sup>®</sup>, and the student system is home grown. Other HEIs have home-grown systems or amalgamations of packages such as People Soft<sup>®</sup> and other home-grown systems.

Approximately 16 HEIs in SA are now using ITS<sup>®</sup> - only seven are not according to the suppliers of ITS<sup>®</sup>. Apparently, the cost of setting up ITS<sup>®</sup> de nova is comparable to the better known commercial ERPs (Duncan, 2005). ITS<sup>®</sup> is used outside South Africa also. It has a weakness in that it is rigid, but so are most ERPs. It did not provide multiple

campus functionality, which was a serious drawback given the HEI mergers involving multiple campuses in South Africa at the time of the mergers (Duncan, 2005). The latest version apparently does now offer multi-campus functionality.

#### ***4.3.7.3.2 Portals***

Portals are viewed as an important issue by Fice (2003), Green (2001) and Kanter (2002). Ethridge, Hadden and Smith (2000: 13) use Morrison's definition of portals as "an application or device that provides a personalised and adaptive interface for people to discover, track and interact with other relevant people, applications and content" and as such support research. They are "single points of service to access multiple data stores including email, and databases amongst others". Portals span the boundaries of formal and informal systems; and of Administrative and Knowledge and Communication Management systems.

Portals can serve a variety of purposes: Portals enable personalised use of applications such as financial aid status, election organisation for committees, meal and parking organisation and online credit card use, to mention but a few. Workgroup applications can include course content and communication management tools such as faculty newsletters, and computer help desk support.

Looney and Lyman (2000: 31) state that portals can be seen as a means of renewing and extending "a sense of academic community". They can provide increased efficiencies, more engaged stakeholders, empower stakeholders by providing access to information resources and communication tools, and they can help to retain staff by providing a sense of membership.

They further maintain that the target users for portals are identified as: students (existing and prospective); staff (administrative and academic) and academic managers; library staff and users; bookstore staff and users; IT staff; alumni groups; associated secondary schools and colleges; business and research partners; and top management. However, portals have been reported as perhaps focusing on student services to the detriment of other, as mentioned earlier.

The main challenges for implementing portals are “getting buy-in from stakeholders, satisfying diverse needs, integration with legacy systems and decentralised sites, budget issues, unrealistic goals, lack of internal expertise and resources, time, security issues, technology problems” according to a presentation by Englert (2003). As stated earlier, some of the problems experienced with portals are that they are not meeting the user needs.

Further problems are identified by them as being, amongst others, the ownership, design and quality of the content posted, the skills needed to create them and thus the cost, the difficulty to keep sites fresh, and the responsibility for effective maintenance.

Despite this, according to Englert, in 2003, 75% of top HEI management saw portals as important to HEIs strategic objectives. 96% of HEIs interviewed were planning, developing or had developed portals. Hawkins *et al.* (2003) and Gultig (2000) show 31% of institutions surveyed in the United States as having implemented portals, 19% in process, 33% planned, and 16% with no plans (of these 21% are developed in-house, 61% purchased and 11% based on open source). The 2005 survey by Hawkins *et al.* show 90% of all institutions as having web portals in process or planned.

As an aside, ITS<sup>®</sup>'s latest version includes portal software, according to the suppliers.

#### **4.3.8 New technologies**

Scanning the horizon is an important part of the IT Director's planning role. The technologies that attracted interest in terms of IT technology in 2003 in HEIs in the USA included voice-over-IP, video-over-IP, public-key infrastructure, enterprise-directory technology, biometric technology, smart card technology, web-service technology, antivirus software, electronic signatures, and wireless security technologies (Hawkins *et al.*, 2003). Deployment of wireless networks was seen as important and growing by Green (2001, 2002, 2003, and 2005).

Almost as a summary to the software discussion, a Gartner report by Yanosky *et al.* (2004) predicts technology usage – see Figure 4-8 for Higher Education.

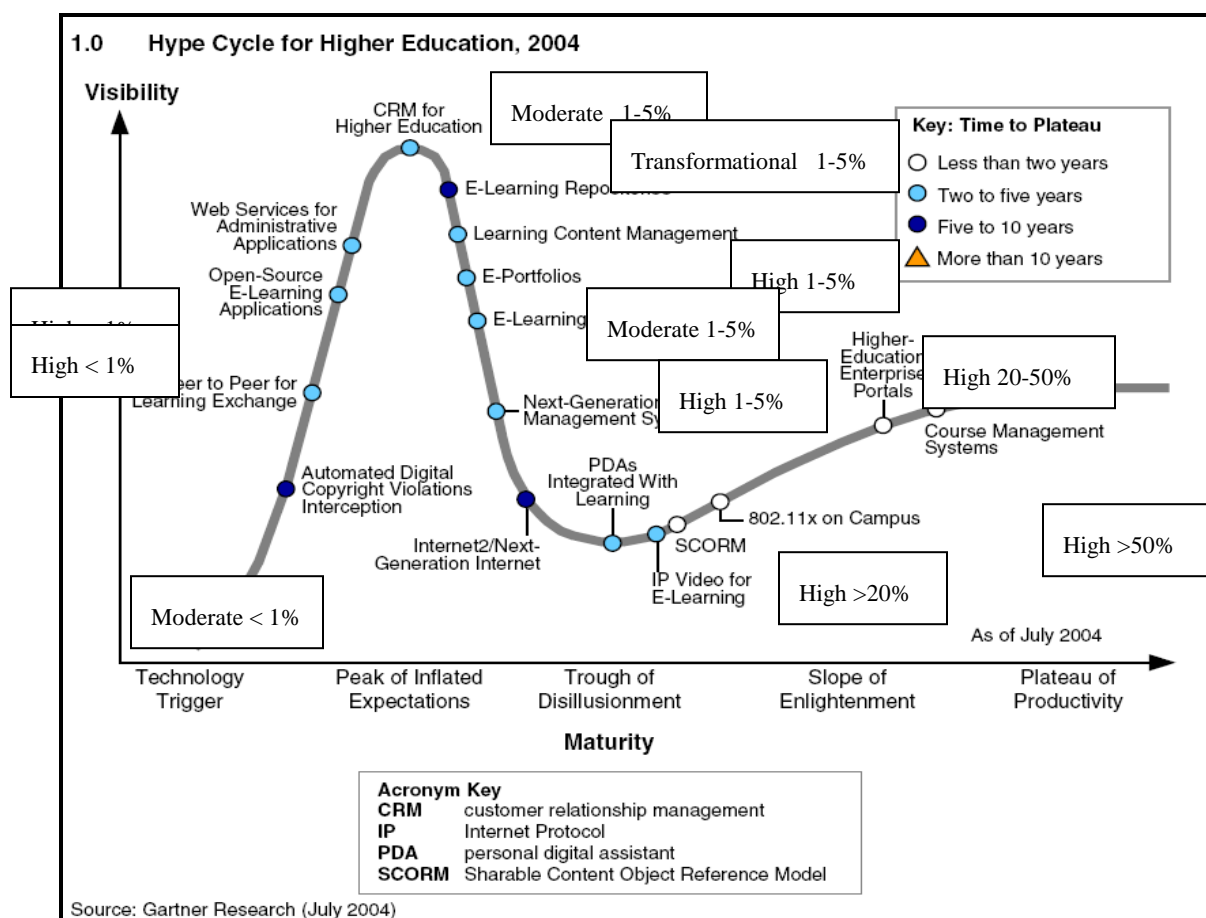


Figure 4-8 Hype Cycle for technology in HEIs—Yanosky *et al.* (2004)

The diagram portrays technologies that have not lived up to expectations, and are losing attention (those on the downward slope), and then highlights technologies that are gaining attention and that become entrenched (mature). As can be seen from this, open source e-learning applications are gaining importance according to the writers, as are web-services for administrative applications. CRM systems are at the top of the “hype-cycle”, that is the impact could be high, but there are obstacles to full success.

Superimposed on the diagram are suggestions of the authors of the report regarding the “Benefit” (High, Moderate), and the “Market Penetration” as a percentage (the selection on relevant items to tag was made by the author of this research). It is not clear whether

the benefit and penetration are for the present or the future. The 2006 hype cycle (as indicated by Lowendahl, 2006) indicate the technologies that are now somewhat discredited: e-Learning repositories, peer-to-peer entertainment for students, CRM for enrolment management, learning content management, open source e-Learning repositories ePortfolios and web services for administrative applications. By contrast the report notes that course management systems have reached a stage of maturity.

The diagram and discussion indicate consonances and dissonances with the preceding discussion, and reflects somewhat different concerns and usages to that found in HEIs in SA.

Interestingly, writers such as Grant and Anderson (2002) have stated that IT at HEIs follows business trends, and are therefore not at the “bleeding edge” of technology use. This may be an option that minimises risk, but Wagoner in Metcalfe (2006) notes a fatigue symptom where as the hype about a particular application or technology passes, projects lose way (this was focused on Knowledge Management Initiatives, but has relevance to other technologies also). Therefore, being a follower poses other risks.

Not only do HEIs follow business, but developing countries in most respects follow developed countries in the use of IT by a lag of or two or more years. Given this statement, these issues should now become important in SA. They were not amongst the issues mentioned in the surveys of South African HEI IT Directors as conducted by Bosire and the author (Bosire, Roets Survey, 2003 - Appendix A).

#### **4.3.9 Information needs**

Although transactional information needs may be met by the systems in place, writers refer to concern about information management in HEIs.

Of particular concern are internal users of information such as senior academics. Loughridge (1996) states that information management is poor in HEIs, with specific reference to academic management needs. She summarises a survey conducted to assess the information needs of Heads of Departments (HoDs) by stating that HoDs were

“largely dependent on the informal network of contacts for information” and their perception of MIS in universities was poor, late, inaccurate, cumbersome and unsuitable. “Far from being recipients ... they were often net suppliers of information”, and MISs were in place to support senior administration and not HoDs. Marcella and Knox (2004) quote Greene and Loughridge, noting the following as obstacles to Head of Department (HoDs)’s MIS needs: barriers in accessing external data, lack of integration of systems, and poor response in areas such as financial management. They furthermore conclude that concerns exist about validity of internally created data.

A further report by and McManus and Loughridge (2002) states that information management is generally seen as poor in HEIs. Registrars echoed this, but saw their roles as supplying information to superiors and external bodies rather than having a responsibility to academics (Loughridge, 1996). This lack of information is amplified by Guan, Nunez and Welsh (2002: 168) who write that (i) administration and policy staff need improved data management to support resource management and strategic planning, (ii) faculty and administration need information to retain and recruit students, (iii) and the State is demanding more performance information. They state that “only a fraction of the data ...” captured and stored is actually available to decision makers. Davenport (in Bernbom, 1998) mentions the vast amount of knowledge created by universities, which is never used. Guan *et al.* (2002) further state that because of the complexity of HEI structures and the variety of stakeholders, it is necessary to have access to vast amounts of data, and this is usually not available (in the form required). In clarification, they mention as an example that with some of the ERP software being used, an integration of over 30 tables is required to produce a class list. Legacy systems also complicate the picture. Penrod and Dolence’s work in 1991 stated that higher education needed transformation to meet the challenges of higher costs and new levels of expectation for service. This required a strong emphasis on the availability of quality information and therefore a change from “managing information systems as a utility to managing information as an agent of change” (Penrod and Dolence, 1991: 5). Allen and Fifield’s (1999) research revealed that information systems at HEIs were fragmented, with



individual databases situated in departments and units. In the author's experience, this is still the case at HEIs where disparate systems are maintained and information transferred semi-manually between them, at the cost of efficiency and accuracy.

The State also requires information. In South Africa, the Government has set up a system (The National Higher Educational Information and Management System - HEMIS) and HEIs are required to submit information for importing to this system to provide a range of statistics on a regular (annual) basis. This places demands on the institutional systems.

The above discussion highlights the fact that there are concerns about information management and the fact that information needs are not being planned for strategically. This is particularly true of academic management needs.

As HEIs become more dependent on IT, the reliability of the services becomes paramount. Specifically mentioned are the priorities of reliability, availability, accessibility and predictability (Bernbom, 1999). Bernbom speaks about the need for quality in information. This need is echoed by the calls for good governance (Section 4.3.5.1). The quality of information is commonly characterised by features such as accessibility, reliability, comprehensiveness, fit-for-purpose, accuracy, replicability, and freedom from bias. Bernbom adds to this by stating that quality information should also be characterised by authenticity (reflecting the real world), authoritativeness (be able to reference source), intelligibility; security by eliminating redundancy, and having common definitions.

Bernbom (1999) elaborates further by categorising HEI information needs. He enumerates five essential uses of information in HEIs: (i) transactions for routine business; (ii) decision-making, especially by combining different sources of information; (iii) assessment such as census data; (iv) archiving information about the institution, and (v) evidence of actions to comply with regulations. He writes that HEIs typically exclude scholarly record information such as research results, literary and creative works, and experimental data in their management of information. He maintains that other less

easily categorised information exists, such as computerised instructional material, records of electronic communications amongst scholars and students, factual databases, and compilations. Bernbom states that it is important for the informal web-type information to be managed equally rigorously.

The discussion on information needs leads into the planning for uses of IS/ICT-supported information for Knowledge and Communication Management at a strategic level at HEIs.

#### **4.3.10 Knowledge Management and Communications Management**

Communication Management (CM) and Knowledge Management (KM) are closely intertwined, although both encompass more than just the employment of IS/ICT. KM is accepted as an important enabling factor for learning organisations. This is particularly so for organisations that are information intensive, and so by definition for HEIs.

Kidwell, Van der Linde and Johnson (2000) state that KM programmes are focused on creating repositories of best practice, operational excellence and cost reduction, but they feel that spurring innovation is the most important area. As the pace of academic change increases, information is increasingly held by limited life span teams, hence KM becomes all the more important. The move to less tenure and more contract staff in HEIs makes knowledge management important for HEIs.

KM systems can be broadly categorised as explicit KM systems and tacit systems. Explicit KM systems codify knowledge, and store it in a searchable manner electronically. Tacit KM systems are systems that enable unstructured (and possibly higher order) knowledge creation and sharing. The dividing line is somewhat subjective. However, in this report, CM systems and tacit KM systems used for expanding communications are viewed as synonymous.

##### **4.3.10.1 Knowledge Management (explicit)**

Hendriks and Vriens (1999: 114) emphasise the importance of KM by stating that knowledge –intensive organisations such as professional organisations “lean more

heavily on intellectual assets” – “the more crucial knowledge is to an organisation, the more important its capacity to renew its knowledge”.

Systems exist that can be classified as supporting KM in HEIs. Rowley (2000) states that significant KM programmes can be found at HEIs although not explicitly seen as such. Databases such as corporate financial databases, library, market information and marketing department’s prospects list, document management (storage, sharing, indexing and searching, archiving and disposal document management, and creation, sharing and maintenance of information), publishing of policy documents and best-practices and lessons-learned are explicit knowledge technologies although these are not integrated. Other examples are web intranet content pages, intelligent search agents, case based expert systems for help desk applications, as well as the library and research systems already described (Corral, 1998; Rowley, 2000).

Access to knowledge is good in the UK according to Rowley (2000), and she explicitly mentions the role of SuperJanet where academics are easily connected to each other as well as to electronically published material. Kidwell *et al.* (2000) write that some universities are reputedly managing intellectual property as an asset and reward commercially viable knowledge production. Rowley (2000) writes that KM at HEIs is different from corporate organisations in that cooperation is found between HEIs to provide these resources.

Corral (1998), by contrast, states that KM projects in HEIs have not been adopted widely and that a gap exists between theory and practice. McManus and Loughridge (2002) state similarly that KM has been unpopular at Universities although the University of Leeds, for example, maintains that it has developed an institutional information strategy which is close to a KM programme with intellectual property issues, research expertise management, information analysis and mapping skills. Rowley (2000) also contends that HEIs fall short in valuing their intellectual assets.

Kidwell *et al.* (2000) maintain that KM (creating, revealing, sharing and using) can flourish in an organisational climate of a learning organisation where that organisation is

defined as one with a shared vision and practice, flat organisational relationships, and a sense of community characterised by empathy and trust (quoting Davenport) and Townley (2003) states that HEIs are more likely to demonstrate these characteristics, since their mission is that of being a learning organisation, by definition, and their traditional structures fit the above requirement, while their operational processes involve trust and empathy. McManus and Loughridge do not agree. They state that the organisational culture of universities is one of the main reasons for slow adoption: academics are interested in knowledge creation, but not dissemination, particularly because research work epitomises the intellectual capital of staff and staff promotion is on the basis of individual performance and not on team effort. Tied to this is the objection by academics to corporate/centralised management.

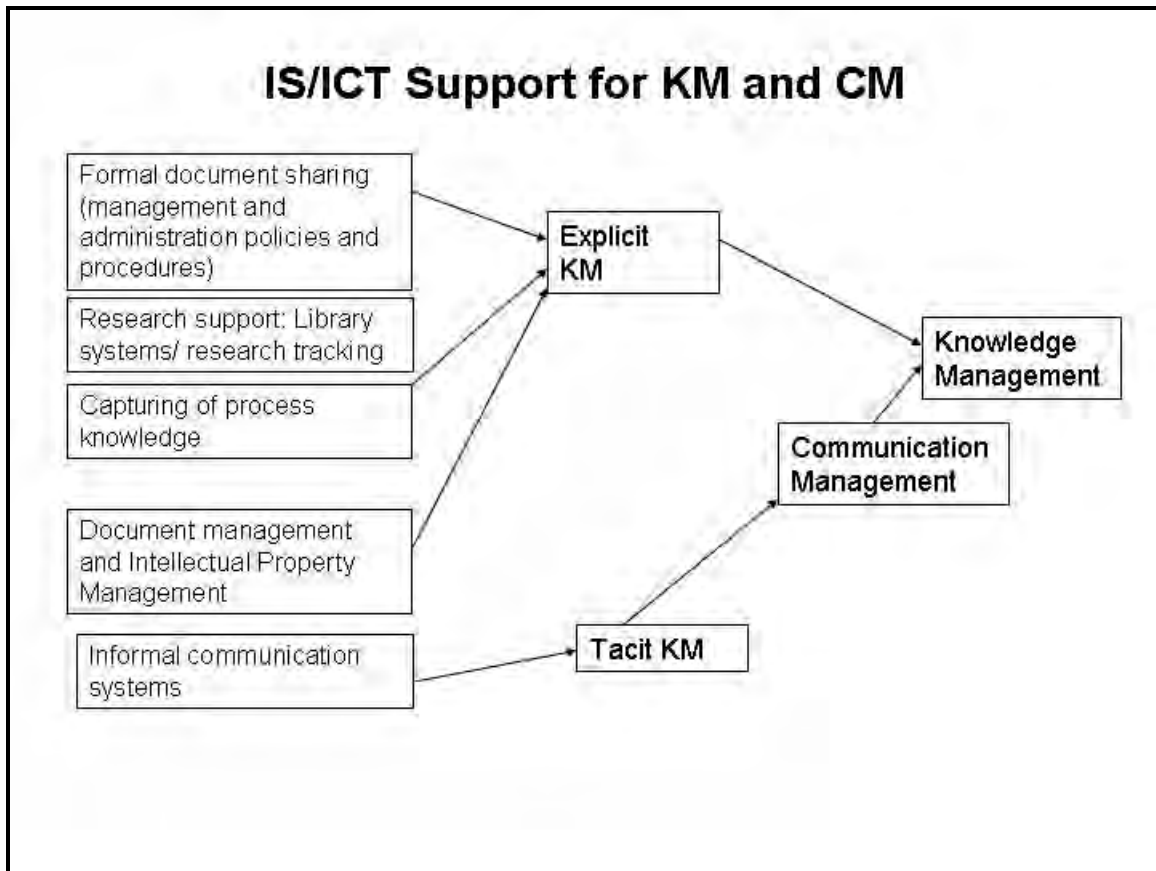
Townley (2003) states that the biggest challenges for HEIs are effectiveness and accountability, and that KM can help with this, but that HEIs have been slow to adopt KM.

The types of software that are likely to become more and more important are data mining and data visualisation software. Tolmi (2005) discusses the use of IT in support of KM in HEIs, and mentions the use of software to gather information from web hits, that could be useful for marketing the University. He notes that data mining techniques can be used to highlight student performances and identify common factors (a particular course, for example, in which students always perform well) and software that could analyse a student's registration to check for correctness before the final registration is confirmed.

The consensus appears to be that HEIs have the ideal climate in which KM should flourish, but that it is not necessarily happening formally, and that sources of information are big, but are scattered and not easily accessed electronically.

#### **4.3.10.2 Communications Management/ Tacit KM**

Using the scoped definition of tacit KM or Communication Management and their IS/ICT implications in HEIs, Figure 4-9 (adapted from Figure 3-7 proposed in Chapter three) indicates software mentioned for KM and CM.



**Figure 4-9 IS/ICT and KM and CM at HEIs**

In support of tacit KM or CM, groupware and tools to support knowledge networks and communication (one on one, one to many, arranging and holding of meetings, facilitating group discussion), personal and group productivity tools, route maps and directories, and campus search engines exist (Corral, 1998; King, 2002; Phillips, 2001; Phillips and Browning, 2001).

Less “exotic” systems are also used. Kidwell *et al.* (2000) state that portals are the technology of choice for knowledge at universities. Green’s 2005 campus computing survey reported that 45% of institutions had portals, but campus portals were still ranked low as a service. Email and web usage is certainly very suitable for knowledge sharing and web technologies encompass static and database backed web pages, discussion

forums, Internet chat and instant messaging, video and audio streaming, and visual and audio conferencing, Frequently Asked Questions (FAQs), content management (Phillips and Browning (2001) state that content management systems are an immature technology), portals, expert reporting, data mining, search engines and conversational technologies. Others are group decision support systems (GDSS), weblogging, and Wikis. McKeen (2004) notes that email is the most widely used technology after the telephone.

The extensive and rapid take-up of electronic communication (especially email) has been astounding. It has, of course, brought its own problems – massive storage requirements and management thereof (forcing people to keep their mailboxes cleaned up and arguably throwing away knowledge), information overload, viruses, spam, posing new problems for IT managers. For individuals, being contactable day and night might not always be positive, but almost no-one would wish this connectivity away.

Communications and knowledge sharing can be facilitated by Web and Internet activities, as well as informal systems. However, there may be surprising (or emergent) effects. Romm and Pliskin (1999) examined the use of email in an HEI. The technology improved inter-organisational communications, less time wastage by secretaries resulted (which has as a by-product a shrinking phone bill), and improved access to superiors for secretaries. Global communications also increased. However, it enabled “rebel groups” to form a stronger resistance group than would have been possible before, and as a result a code of practice was introduced. Far from improving top-down hierarchical communication, the technology had a decentralising effect. This example demonstrates the possibility of giving sub-cultures a voice, which is important for multi-culturalism, but needs to be planned to prevent perhaps negative emergent behaviour.

#### **4.4 Strategic management of the IS/ICT function**

Clarke (1994) quotes Ciborra and suggests IT plays a major/strategic role when an organisation fits into the top right quadrant of the Information Intensity matrix (Figure 3-7 taken from Porter). This has implications for HEIs, as they are typified by having a

“high information intensity product” and “high information intensity of the value chain”. This research thus advocates the full exploitation of IT in HEIs at strategic and operational levels in order to achieve goals of efficiency, effectiveness and if necessary transformation. In order to do so, the author proposes that strategic management of the IT function is required.

There are two aspects to strategic management of IS/ICT. The first is the support given for organisational strategic planning and the second the management of the IS/ICT function. This section explores the second aspect (whilst not disputing the importance of the first aspect, that is, the support for strategic planning by the provision of information).

#### **4.4.1 Strategic issues of concern for IS/ICT**

Many of the management issues mentioned for IS/ICT as well as technology issues can be seen as more or less strategic. Merging of institutions is certainly strategic (but will be dealt with further on under “transformation” – Section 4.6.2.2).

The decision on which of these (or other areas) are important are decided on through the analysis and planning processes of strategic management.

#### **4.4.2 Planning and analysis**

As far back as 1978, Wetherbe and Dock (1978: 1008) stated that “unfortunately, the computing effort has been conspicuously void of comprehensive planning and control activities in most organisations. It is somewhat alarming to see an activity as pervasive and sophisticated as computing provided with less management scrutiny than other organisational functions”. And “University computing, where the computing effort must support both administrative and academic activities, has been characterised as the most difficult environment in which to achieve comprehensive planning”. It was uncommon both for HEIs to have strategic plans, and for IS/ICT explicitly to support those strategic plans.

However, the situation has changed. In the USA, Ringle and Updegrave noted in 1998 that the Educause website had more than 80 copies of strategic plans for HEIs in the

USA. They further conducted a survey of 150 IT Directors of HEIs. The responses were that 10% said they did not do strategic planning, as it added no value, but that the rest spent a great deal of time on strategic and financial planning. In 2002, an IAU report states that just over 50% of all HEIs surveyed have a central strategic plan for ICT activities available on-line (International Association of Universities, 2002). In the UK, many HEIs have published their IS/ICT strategic plans. Bristol University is one such example where they specify that their plan is linked to the University Plan, their Information Strategy, and their ICT strategy. They state that their information systems are largely “mission critical” (Phillips and Browning, 2001). Hawkins *et al.*'s 2003 report states that 72% of HEIs surveyed had a stand-alone SIS.

Somewhat more negatively, Ringle and Updegrave (1998: 18) write that planning was being done, but “...for day-to-day operations, the quality of service and the implementation of new initiatives”, but the use was questionable. Similarly, a study by Brown (2004) and Brown and Roode (2004) notes the gap between what is preached (theory) and what is actually happening (practice) especially in SA. Part of the problem for HEIs is that HEIs have less than clear goals and objectives for historical reasons noted in detail previously in this paper. In the survey conducted by the author (Roets Survey, 2003 - Appendix A) of the 12 responding IT Directors of HEIs in SA, seven said that they had strategic IS/ICT plans in place, two said they did not, and three did not respond. Of those who replied that they had plans, some stated that the plans were not necessarily formal. This seems to imply that just fewer than 60% had strategic plans in place. These were reportedly found useful (sometimes), but the main use was to be able to lobby for strategic funds.

McCann *et al.* (1998) also report on the common lack of analysis and planning in IS/ICT at HEIs. This is supported by Fielden and Simon (1997) who note the problems with MIS implementation in Universities, where they state that organisations “proceed directly to procurement or development of a MIS without undertaking initial planning” and that some institutions devolve the MIS plan to the technical IT staff, and the plan is often prepared without full consultation with users.



SIPM is difficult for all organisations, and equally so for HEIs. Reasons for failure of strategic planning quoted are: technology evolved too rapidly; a lack of resources to meet technology demands; users did not know what they would need in the future; there was failure to get commitment from the right people; and lack of suitable leadership (Ringle and Updegrave, 1998). Foster and Hollowell (1999) note the importance of IT leadership in planning.

The need to plan for emergent issues is mentioned by them and that tactical as opposed to strategic planning is also required. Chae and Poole (in Metcalfe, 2006) note that HEIs differ from the private sector in that HEIs are governed by committees, so that committees have to be convinced to implement new systems and commitment to the systems is lower. Rowley *et al.* (1997) take this statement further by examining strategic management at a specific HEI where a participative planning approach was used to cater for the committee-mindset of HEIs. Although this was not focused on IS/ICT strategic management, it is obviously applicable also, and is a step towards “bottom-up” strategising and goal setting.

In Chapter three (Figure 3-5), the author has proposed extended areas for strategic management of the IS/ICT function, specifically that the SIPM should encompass not only IT and IS planning, but also Information planning encompassing Knowledge and Communication planning and management. This holds especially for HEIs given the centrality of information and knowledge, but is not mirrored in the literature as happening at HEIs.

#### **4.4.3 Implementation and control**

This section examines whether there are issues specific to HEIs in the management of the IT function in order to realise the strategic goals of both the IT function as well as organisational objectives. These may be issues that would/could affect support for the organisation at strategic, tactical/management and operational levels. The management of the IS/ICT function incorporates the structure, staffing, budgets, acquisition of

technology, balancing a software portfolio, and a constant check on effectiveness of the services rendered to enable the organisation to meet its specific goals.

#### **4.4.3.1 Implementation - structure**

If the aim is to adapt to changing circumstances, then the IT staffing structure should be flexible, and a matrix structure has been suggested in this respect (Ahituv and Neumann, 1982). This usually implies having an interface person(s) between a unit and the IT function. This is happening in Faculties and Departments, where a person has been appointed by the Dean or HoD as systems administrator, or as an IT help-desk support.

#### **4.4.3.2 Monitoring**

Once staffing and technology has been installed, monitoring of the effectiveness of the services offered is vital at process and strategic levels. Fleit (1994: 5) notes that measures that are used in typical service organisations such as repeat customers and strong profitability are not necessarily appropriate at universities, where the users are “a captive audience who have no choice but to use [the IT] services if they want any service at all”. Various management techniques are being used by IT management: a prime example is Balanced Score-carding. Instruments have been developed to measure service quality specifically of the IT Division. The literature is not clear on how often these are used. Interestingly, Katz and Salaway (2004) note that the perceptions of service are not related to factors such as institution type, respondents’ age or gender, or institution size. They found a defining factor to be IT staff’s level of seniority in their perception of service quality. They note a progression from perception of quality from high to low by the following categories in descending order: senior IT leaders, central IT staff, IT professionals working in central support units, and finally IT staff working in academic units.

Writers suggest the following factors for the success of the IT function and a successful IT Division in HEIs:

- The creation of an environment where IT missteps are rare

- Optimal use of resources
- Fostering satisfied users
- Providing communications between providers and users
- Providing access to Information Technologies
- Expertise and training
- Promoting strategic technologies
- Stewardship of data
- *Serving students through IT support for teaching and learning*
- Providing on-line business services
- *Coordination of curricula system-wide*
- Supporting the institution's work through enhanced workflow and business processes
- Data services to support upper management and facilitate external relations
- *Support for research*
- *Involvement in strategic planning on a face-to-face basis at academic levels*

(Bantz, 2001; Ringle and Updegrove, 1998).

Many of these factors would hold for all organisations, while some (italicised) are specific to HEIs. Evidently, when monitoring, an assessment of these factors is useful.

A study by Lund (1998), however, stated that the opinion of respondents of the Commonwealth HEIs survey on the effectiveness of the “management of computing services” was low - only 6% thought this effective.

## **4.5 Alignment**

The need for alignment was one of Kanter's top-ten issues in 2002, and is repeated by Prewitt and Ware as the top managerial issue in 2006 (Kanter, 2002; Prewitt and Ware,

2006). However, the disappointment voiced on the support of IT for organisational strategies and processes hold for HEIs also. Paterson (2004: 2) states that “the need to integrate or align HEI business models and information systems remains one of the most important ongoing challenges in the sector internationally, but many institutions have been slow to respond”. He gives two reasons: resource scarcity and the view of IS/ICT as purely a support function for HEIs. Ringle and Updegrove’s 1998 survey stated that alignment was one of the main reasons for lack of success in strategic planning (Ringle and Updegrove, 1998). By contrast, a study by Pirani and Salaway (2004) in the USA reports that 81% of institutions examined stated that they had a high alignment between organisational and IS/ICT strategies.

Pirani and Salaway’s study (2004) of IT goals in HEIs coupled with the number of institutions reporting compliance with those concerns is listed in Table 4-4:

<b>Strategic Concerns</b>		
<b>Goals</b>	<b>Number of</b>	<b>Percentage of</b>
Align technology with institutional priorities	367	76.0%
Secure financial & other resources	255	52.8%
Enhance IT Service levels	218	45.1%
Identify competitive opportunities	102	21.1%
Document institutional IT priorities	98	20.3%
Build alliances with key decision makers	80	16.6%
Improve communication with users	78	16.1%
Identify new service requirements	72	14.9%
Identify internal improvement opportunities	70	14.5%
Increase top management support	38	7.0%
Fulfil an administrative mandate for planning	34	7.9%
Focus on/Scan for leading edge	18	3.7%
Orient a new leader to the state of IT at the institution	6	1.2%

**Table 4-4 Strategic Concerns - Pirani and Salaway (2004)**

This survey suggests that alignment and finances are the most important strategic issues. Interestingly from the table above, it would seem that internal operations are attracting less effort than strategic management (Pirani and Salaway, 2004).

In South Africa, a study by Venter (1992) indicated that Universities had a relatively low maturity level of alignment. The author's survey (Roets Survey, 2003 - Appendix A) found that of those HEIs who had strategic plans, surprisingly only one responded that their plans were aligned with that of the organisation. Alignment thus appears to be a problem. Similarly, Motjoloane (2003), in the case study of two HEIs in SA, found evidence of strategic planning at both organisational and IT level, but that the linkages

between the two were not high. Alignment and management commitment were also issues mentioned in the surveys by Bosire and Roets (2003 - Appendix A) as areas of concern. Added to this was Brown and Roode's study (2004) where it was found that strategic planning and alignment were theoretically, but not practically, in place.

Pirani and Salaway (2004) write that in a comprehensive survey of HEIs, it was found that alignment was a process and not a goal, and that alignment was more difficult in turbulent environments (despite being more critical then). The recommendation from this report is that "formal and inclusive" IT planning should take place. Championing by the VC and constant communication with all other internal stakeholders, "administrators, faculty and students" to gain input was important. The report indicated that senior management was often asked for input, but less often faculty. Interestingly, this report found that a large proportion of organisations obtained input from either an academic or administrative advisory committee (> 60%), and that 45% of HEIs involved students in the process.

A report published by the Higher Education Funding Council of England (HEFCE), identifies issues for obtaining full benefit from IT for HEIs (Higher Education Funding Council of England (HEFCE), 1998). Many of the issues echo those from Chapter three as factors that support strategic planning and alignment "Commitment from senior executives" and "Development and implementation of IS strategy allows for alignment to be maintained"; a strategic focus on "information needs rather than technical considerations"; and "adequate resources as required for realistic targets".

Given the discussion, strategic alignment at HEIs in the USA appears to be satisfactorily resolved, although some disagreement exists regarding this. Writers state that this may, however, be more in theory than in practice.

#### **4.6 Transformation or change**

The term transformation has been defined narrowly in terms of the SA Government requirements for HEIs, but the larger definition implying significant change and encompassing issues such as transparency, empowerment, and changing processes is also

being used. This research refers to these as the narrow and the wider definitions of transformation or change.

#### **4.6.1 Strategic planning and leadership**

Thus far, it has been assumed that strategic analysis and planning of HEIs encompasses change and the role of IS/ICT to support the strategic management of the organisation has been explored. IT leadership is important for sparking new directions, and a study by Katz and Salaway (2004) states that strong leadership is shown by IT in the institutions investigated. The fact that strategic management of IS/ICT in HEIs is commanding attention appears to be positive, but the reported misalignment is also an area of concern for SA HEIs.

#### **4.6.2 Effective service**

##### **4.6.2.1 General**

The support IS/ICT gives the organisation in order to effect strategies relies on the smooth functioning of this Division, once alignment for strategies has been put in place. Again areas of concern have been raised in the preceding discussion. The areas of concern are: accountability on the budget and value for money from IS/ICT expenditure, the perception of service levels, the perceptions regarding governance issues, the lack of user involvement in planning, and the concerns expressed about the lack of IS/ICT supported KM and CM at strategic level, and finally the serious lack of academic management support.

##### **4.6.2.2 Transformation - Mergers**

This section examines the role of IS/ICT in mergers as a form of transformation that is especially crucial in SA HEIs at present. IS/ICT has a further role to play in transformation or change, however, as a change agent with regard to its role in facilitating process reengineering, facilitating new and broader communications, and by its role in

detecting and determining new strategic directions for the organisation. It may also provide different and flexible support for the mixed mode management style of HEIs.

High on the strategic transformation list is the issue of mergers and incorporations of HEIs. This issue does not feature on Kanter or Green's list of important issues, but Fice mentions it in the UK context, and unsurprisingly in South Africa, it ranked as the most important issue in the author's survey of SA HEIs (Roets Survey, 2003 – Appendix A) (Green, 2001, 2002, 2003; Fice, 2003; Kanter, 2002). Certainly mergers bring about massive change. Remarkably little on the use of IS/ICT in mergers in HEIs can be found in the literature.

IS/ICT can be a stumbling block to this change. Incompatible and inflexible systems can cause a great deal of trouble and cost. Mergers of HEIs fall into the category of horizontal mergers, and the processes should be very similar, making it easier for IS/ICT to support. However, especially in SA, many of the mergers have been between Technikons and universities, and their processes and procedures are different. Porting data is not without complications, and data quality can be compromised as course structures are often very different.

IS/ICT can also ameliorate merger-induced change by improving communications. Paterson (2004) states that it is ironic that so little attention has been given to the role of IT in mergers when HEI mergers are taking place at a time when an "extremely rapid take-up of information technologies in higher education" is evident. He writes that IS/ICT can contribute to the challenges faced by institutions that are undergoing mergers. He notes that they can support, amongst others, the forging of a new culture and ethos, obviously support integration of the processes such as support services and academic programmes, and support the development of new academic structures;" (Paterson, 2004: 2).

Two of the issues highlighted by Paterson as facilitated by mergers are those of process reengineering and cultural reshaping.



### **4.6.3 Process reengineering (BPR)**

A search for efficiency is often a driver for process re-examination and/or reengineering. Business process reengineering or examination is an important area if HEIs are serious about adapting to new pressures for efficiency. IS/ICT was the initial push for business process re-engineering (BPR) of internal processes. The movement was hyped beyond its value and was discredited. However, the value of re-engineering with the use of (but not driven by) IS/ICT is now once again an area of importance, and the new emphasis is on process management. Change management is used and process reengineering is usually approached more incrementally than was BPR initially, to lessen the negative impacts.

Mergers are another reason to re-examine processes against “best-practice” processes, and the role of IS/ICT in enabling these changes.

### **4.6.4 IS/ICT as a change agent**

Not only do mergers force a re-evaluation of processes, but planning for the acquisition or development of a new system also requires an investigation into the processes existing and those supported by the new system. IS/ICT in this respect then is a change agent. A new implementation of an ERP system implies changing processes as customisation of ERPs are fraught with problems (Yakovlev, 2002). One of these is the skills required to do the customisation, but the more major problem is coping with software upgrades thereafter.

Yakovlev suggests that administrative reengineering should precede core operational reengineering (specifically teaching and learning). This is debatable, but the differentiation is useful.

Communication is vital during any process reengineering. This was pointed out by Yakovlev (2002) in the adoption of an ERP system by HEIs which entailed process reengineering. IS/ICT can improve the communication process.

#### **4.6.5 Communication enablement**

As Paterson (2004) mentions, IT is a major boost to communication during mergers, and so indeed in any change in the organisation. Email has proven to be a major communication tool (although this presupposes a culture of reading and responses, based on a stable network and server infrastructure). IT communications are a leveller, and as such a powerful tool for communications.

A report by McKinney and Whiteside (2006) examines media usage. They divide media into categories of traditional media, (face-to-face and letters), connecting media (phone and fax), and electronic media (video and email). They devise a media richness score for each of these, which they compare against media naturalness. Not surprisingly face-to-face and videoconferencing are seen as media rich, phone next and then email, followed by letters and fax. Greater media-richness is better for distributed communication. They find a surprising “negligible preference” for phone over email use. They answer this by stating that “the frequent use of email and technologies (such as instant messaging, automatic messaging and voice mail) may blur the perceived difference in the richness of email and the phone” (2006:85). These findings support the necessity for computer literacy in order to use such technologies effectively, but indicate the need for all these types of technologies over multiple campuses.

#### **4.6.6 Cultural reshaping**

As Paterson (2004) concurs, IS/ICT has possibilities for cultural reshaping in HEIs. Email and the intranet have possibilities for spreading organisational values and cultures more effectively than meetings and paper media. Katz and Salaway (2004) state that IT innovation and initiatives result in “positive cultural change”. Discussion groups facilitated by IS/ICT also have the possibility of allowing views of minority groups to be surfaced. Technology thus is a transformation enabler.

#### **4.6.7 Change in core operations and IS/ICT**

The core operations of teaching and learning and research are very much a knowledge management issue, and the reengineering of these processes, especially the former, is being researched widely (a number of conferences are and have been called such as the eMerge conference in South Africa). The driver for this re-examination is the increasing demands made on lecturing staff, the fact that one-on-one teaching is no longer possible, and then the functionality offered by IS/ICT firstly in trying to ameliorate the stress of academic staff, but also leading change by enabling new and different ways of teaching and learning. Massy (1997: 3) writes insightfully that HEIs' "constancy is truly venerable" as examples of institutions that have remained virtually unchanged since around the 1500s. He ascribes this to the underlying technology – the written, printed and spoken word used in teaching and research. However, HEIs are now transforming, not because of environmental forces, but because technology has changed and offers greatly different options for teaching and learning. He categorises the transformation of the core process of teaching by technology into three stages: Productivity aids such as word-processing and presentation software; enrichment aids such as information acquisition through the web and the use of multimedia in the classroom; enablers of education process reengineering – ways of using technology to teach differently through the use of technology. The main reason for reengineering is to improve the quality of teaching. Technology may take over some of the more mundane tasks of transmission of information and allow senior staff to spend time in discussion in small groups – a better way of using their expertise, while the burden of more rote matters can be carried by assistants and technology. Technology may also contribute to team-based course development, and thus improve the knowledge creation and retention (KM), and improve innovation.

Some academic administration has been reengineered by having students submit only electronically generated documents (to improve readability), submitting assignments electronically, and using multiple choice questions for electronic marking and grading. Portals and web technology are being considered as possible supporters in this venture.

More research as well as innovation is required to fully exploit the transformative possibilities offered by technology in the core processes. This can expand to research (already discussed in Section 4.3.7.2.5) and possibly, community involvement.

Innovative ways of collaboration could be used facilitated by IS/ICT.

Given the perceived lack of support for academic management, this is an area where change/innovation is vital.

More research is required to investigate how IS/ICT can be used to support diverse learning backgrounds and styles. Evidently, it can support learning at different paces, provided a large portion of teaching/learning occurs through Internet or other electronic sources, but IS/ICT could be used to support cultural differences more specifically, and support interventions may also be more easily supplied. All of the above points to major transformation of the core processes enabled and led by IS/ICT, again in the larger sense of the word. In South Africa, the support for diversity of learning abilities and creating “comfortable” learning areas for diverse groups would be supporting transformation in the narrower sense also.

#### **4.6.8 Flexibility and speed of decision-making**

Learning organisations are touted as being able to respond to change faster. The value of knowledge management systems supported by IS/ICT as facilitating a learning organisation have already been discussed in Chapter three.

However, flexibility of HEIs can be hampered by IS/ICT through legacy systems and ERP systems that are not flexible. Web services and component based software may be the answer, and indeed that is one of the “hot” issues mentioned by Fice (2003) and Kanter (2002).

Supporting decision-making and management in the perhaps peculiar mode(s) of management by committee and consensus in HEIs is an area where IS/ICT can be utilised to improve both the effectiveness and efficiency of decision-making: efficiency through improving the speed and quality reporting for and after meetings, and effectiveness by

providing better information on which to base decisions, through the use of software to filter and analyse information prior to meetings. The gaps between academics' decisions and administrative implementation, and the loops between Faculty and Senate decisions can be ameliorated through the use of IS/ICT.

Furthermore, the description of HEIs as working independently at the lower (departmental) levels to achieve their goals, which may be competing with other units' or indeed the organisation as a whole's goals, can be countered by using IS/ICT communication channels to overcome these insular "pipes".

#### **4.6.9 Leadership for change**

Leadership by IT is vital to foster innovation and creative use of IS/ICT.

Katz and Salaway's research (2004: 5) examines the ratio of "transformational leadership" exhibited by the IT Directors, and found this high. Despite this, respondents found that central IT units were not supportive of innovation. This counters previous research, which states that transformational leadership and innovation are linked, and the writers note that more research is required in this area.

The author holds that detecting new trends in IS/ICT, detecting emergent organisational strategies, and adapting systems to meet these challenges, while being aware of users, their needs and their possibly emergent use of IS/ICT are the responsibility of the IT Director, in order to foster a transformational climate.

Transformation is both a goal and a process (Licker, 2003).

#### **4.7 Conclusion**

Strategic Management of the IT Division is as important in HEIs as it is in other organisations. However, the reporting lines that exist in HEIs make this more difficult than where the reporting lines are clearer. The importance of IS/ICT in HEIs is huge, but this is not reflected in the reporting position of IT Directors and managers.

Alignment of the strategic plans of the organisation and IT is a concern. Planning and

alignment are taken seriously by HEIs in the USA, but are still areas of concern in South Africa. Alignment in turbulent times is difficult, and this has particular relevance for HEIs in SA.

Alignment of IT goes beyond alignment of strategic plans, and also includes IT support for the implementation of organisational plans. The effectiveness of the IT Division is important. In Commonwealth Universities, IT management was reported as an area of concern. Attraction and retention of skilled IT staff is a challenge in South Africa, which may have a bearing on service. Funding of IT is a major problem and this may be the cause of IT not being used to its full potential to enable HEIs to change more flexibly and exploit new technologies.

Customer-centricity, according to writers, is still an unattained ideal in HEIs, and this is epitomised by the levels of IT service in terms of the CRM systems in place, the customer-centricity of the systems in place, and the responsiveness of the Help-desks. Concern is also expressed about software for course administration and student and staff portals.

Choice of technologies is one of the functions at a strategic and implementation level. It is stated that such decisions are more difficult at HEIs compared to business organisations, because the frequency of purchases are lower, and the individuals have less experience in such actions (although at the very large HEIs this may not be true). Be that as it may, some of the technologies under scrutiny would be similar to those used in business organisations, and an opinion was voiced that HEIs tend to follow business and avoid the “bleeding edge”. However, some of the technologies are more specifically focused on educational institutions, with at present, mixed success.

On the question of whether IS/ICT has facilitated or caused transformation in HEIs, again there are mixed answers. In the core activity of research, there is no doubt that the electronic library system and the communication possibilities offered by IS/ICT to facilitate research collaboration has indeed changed the research process immeasurably. However, more could be done in terms of systems to support KM for research.

Regarding the core process of teaching, there have been advances, and a great deal of research is focused on attempting to use IS/ICT fully to change the learning environment. The jury is out on whether this has so far been transformative. Knowledge Management in this respect is lagging in South Africa. In community outreach, the IS/ICT effect has been less publicised.

In terms of mergers, the role of IS/ICT is not seen as particularly noteworthy. However, the role of IS/ICT in facilitating a cultural transformation by broadening communication streams appears under-represented in the literature.

HEIs are striving to be “responsive” institutions. IS/ICT’s role in facilitating agility is similar to that of any organisation: it can be used to support process reengineering, and this is occurring. The ERP systems in place can stifle agility by being inflexible, as in any organisation. The traditional slow decision-making peculiar to HEIs and the mixed-mode of hierarchical and bureaucratic management again does not feature in the literature with any major innovations. Information management is seen as poor in HEIs, and Knowledge Management more so.

The next chapter assembles a model indicating factors that allow IS/ICT to support HEIs and enable change, built on the issues discussed in this and preceding chapters.

## **Chapter 5 Proposed framework and models**

### **5.1 Abstract**

The previous three chapters examined general and strategic management theories, with specific reference to HEIs, and IS/ICT support for organisations, especially with respect to strategic planning and the use of IS/ICT in HEIs in a changing and often turbulent context. This chapter recaps the purpose of the research, summarises the foregoing discussion and then constructs and justifies a model to respond to the problem statement and premises.

### **5.2 Introduction**

To be competitive and to cope with a changing environment, organisations are managed strategically, as well as tactically and at operational level. Much is written about how strategic management for change can be achieved. The assumption is that planning occurs to create change within and without, as well as to cope with changes forced upon the organisation. The extent of the changes can be said to be transformational, if they cause far-reaching changes within the organisation. HEIs are finding themselves in this transformational context. The role of IS/ICT in these changes is the essence of this research.

### **5.3 Problem statement**

This research addresses the following problem: “How can IS/ICT support HEIs in South Africa, at present, particularly related to change and transformation?” as indicated in Chapter one.

This main question was rephrased as a set of five problem statements and propositions in Chapter one and these were examined in the literature in Chapters two to four. These sub-problems will be re-examined in the light of the research writings. The sub-problems and the premises attached to them are repeated from Chapter one, and each



premise is followed by a short conclusion from the literature reviewed in the relevant chapters.

### **5.3.1 HEIs in a changing global environment**

**Sub Problem 1:** “What are the challenges faced by HEIs particularly in SA in the changing global environment?”

*Premise:* HEIs are being faced by massive change drivers especially in SA.

- This premise has been supported by the writings of researchers, as noted in Chapter two. The specific features of the South African educational context indicate that the HEI landscape is in a state of upheaval and change. Some of the changes are fuelled by IT-assisted globalisation in the sense of greater competition, both from “traditional” HEIs, as well as new training institutions.
- The specific SA changes are enforced by Government restructuring of the HEI landscape with respect to access and participation rates, especially for the previously excluded, student demographical representation and staff employment equity, institutional diversity, separation of research funding from teaching subsidy, changing of institutional culture to be less Eurocentric, and the need for a 3-year rolling plan to transform culture and practices.
- In addition, the institutions have been restructured and merged or incorporated which has brought attendant process, as well as cultural challenges.

### **5.3.2 Management techniques for organisations in a changing environment and support by IS/ICT**

**Sub Problem 2:** “What management techniques are used to enable organisations to survive and flourish in the context of change and how can IS/ICT support organisations in this context of change?”

*Premise:* Proven management techniques exist to support organisations specifically in changing circumstances.

- Rational management techniques are effective, but may be too simplistic as researchers argue that these techniques do not allow for intrusion of the chaotic “real world”, and the management techniques were initially based on a manufacturing context. Strategic management is practiced widely, and to be effective should incorporate planning for (emergent) change, and structuring the organisation to be flexible.

*Premise:* Alignment is vital for IS/ICT to support organisations for all levels of strategic management – from planning and analysis to implementation and control.

- Strategic management of the IS function is important: the level of formality of strategic planning depends on the importance of the IT function in the organisation.
- IS/ICT trends and business trends are intertwined. Many of the issues of the 1990s are still pertinent in 2006. Alignment of IT strategy and organisational strategy is still a critical area. This includes support for the implementation of organisational goals, thus the effectiveness of the IT function is equally vital.
- Areas that are ignored, as part of IS/ICT strategic planning and management, are Knowledge and Communications Management.
- IS/ICT is touted as being a necessary condition for a flexible organisational structure, but there are criticisms of this view: IT itself can be a hindrance to flexibility through the long-term nature of the architectural decisions. ERP systems embed processes in their code which are difficult to change (especially rapidly). IS/ICT does, however, have the potential to improve communications which is one of the prerequisite factors for a networked flexible organisation. IS/ICT is also a useful tool in Knowledge Management, which is once again a factor for a learning, responsive organisation.
- The supposition that IS/ICT can support change by fostering the formation of a new organisational culture is less strongly supported by the literature. Organisations, especially multi-national organisations, are attempting to build an organisational culture. The role of IS/ICT in supporting this has not been researched widely, but

Brewerton and Millward (2002) refer to communication flows across an organisation as a success factor in shaping a common culture.

- The information culture of an organisation is important. Although this concept relates to knowledge management, it also relates to ownership of information and care for the quality of information. The quality of information includes the attribute of accessibility, which in turn implies information literacy.

### **5.3.3 Management techniques applied to HEIs**

**Sub Problem 3:** “How can the preceding management techniques, particularly with regard to strategic management, be applied to HEIs, given their arguably more complex structures?”

*Premise:* Management techniques can be applied to HEIs, and can provide useful insights.

- Management techniques were used (in Chapter four) to analyse the environment of the HEIs. Some were found to be more applicable than others, but all provided insights useful for analysis and planning. Some of the models were adapted to HEIs.
- Systems theory, and specifically complexity theory, provides a model for the coupling of subsystems, cybernetic loops and the nature of a learning organisation.

*Premise:* HEIs are in general not being managed strategically because they are “different” organisations. The level of strategic planning is low.

- The “value chain” differs for service organisations, as portrayed by Stabell and Fjelstad’s model (1998), and HEIs can be viewed as a special case of a service organisation.
- HEIs have more complex goals and traditionally often competing goals by the sub-units – (departments) which is not a feature of for-profit organisations. Most of HEI decision-making is committee decision-making and is thus often sub-optimal in terms

of efficiency. However, decision-making may be more effective in HEIs because committee decision-making ensures greater levels of commitment.

- Strategic planning for HEIs as developed by the rational school of management's technique are shown to be useful, and used widely especially in developed countries, and the premise that HEIs are not managed strategically is not supported by the literature. However, these techniques are perhaps simplistically applied and not adapted to the complexities mentioned for HEIs, especially those in less developed countries. The techniques may also be more stated than enacted.

#### **5.3.4 Use of IS/ICT in supporting HEIs with reference to change**

**Sub problem 4:** “How can IS/ICT be managed strategically in HEIs in order to support transformation for HEIs to meet the challenges of the changing context?”

*Premise:* IS/ICT strategic planning and alignment is in its infancy in HEIs in South Africa, but at the same time the level of strategic planning required depends on the nature and context of the HEI. IS/ICT strategic management, specifically to support change, has not been used widely enough in South Africa in HEIs.

- The level of strategic planning and management of IS/ICT (SIPM) in all HEIs has been on the increase in developed countries and also reportedly in South Africa. The level of formality practiced varies. Questions are raised whether this strategic planning has a positive effect on real operations, or whether it is merely paper-based.
- The alignment of SIPM with organisational goals also appears to be problematic. Opinion is that this alignment is not optimal in HEIs in South Africa.

*Premise:* The IS/ICT tools available for efficient (customer driven) systems are not being used adequately in administration or core processes, and the peculiar needs of HEIs are not being sufficiently addressed.

- The literature supports this premise in that, although the administrative systems are in place and generally functioning well, they are not customer-centric. Particularly in South Africa, the idea of a student as a customer is not widely held in HEIs, and as a

result systems to support them are not as advanced as in developed countries. Certainly the issue of CRM did not appear on a list of concerns of IT Directors in 2003 (Bosire, Roets Survey, 2003 – Appendix A).

- The premise is false regarding core processes in the sense that there is a great deal of emphasis on e-learning (although the extent in South Africa is unclear) and the research support provided by libraries is excellent. However, falling between the stools, IS/ICT support for academic management appears low. Academics express frustration with the lack of information, as their administrative burden grows.

**Premise:** In order to adapt and flourish in a changing context, organisations need to be responsive, and their decision-making processes need to be efficient and effective and IS/ICT can support this need. This is not happening in the case in HEIs.

- This premise is neither supported nor contradicted by the literature in terms of HEIs.

**Premise:** In order to adapt and flourish in a changing context, a “learning” networked organisation is reported to be the most successful. HEIs, despite their very nature as organisations of knowledge and learning, are not supported adequately as learning organisations in terms of Knowledge Management (KM) and Communications Management (CM). Similarly KM and CM are not being used to support a transforming or unifying culture.

- The role of (IS/ICT enabled) Knowledge Management in engendering “learning organisations” is well researched. Knowledge Management in HEIs is seen neither as a major issue, nor a strategic issue. This is in contrast to business organisations, where Knowledge Management is an important topic for 2006. The need for more focused Knowledge Management is high in HEIs, given the fact that they are, or should be, knowledge-based organisations.

## 5.4 Model building: Features necessary for successful use of IS/ICT to support changing organisations

### 5.4.1 Management techniques – a summary

Following the rational school of management, Figure 5-1 depicts the accepted theory regarding strategic planning and management by using an adaptation of Anthony's model for planning and control (Rackoff, Wiseman and Ulrich, 1985).

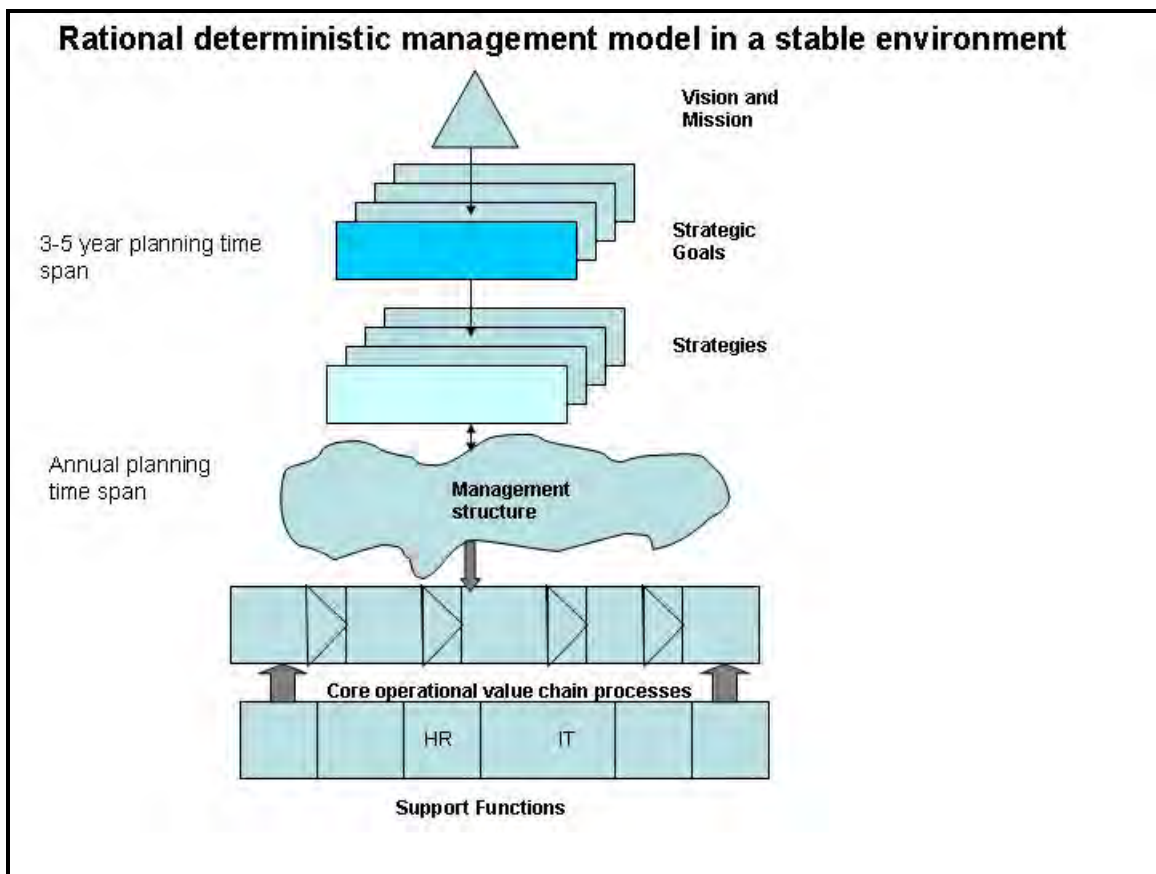


Figure 5-1 Management Theory - Rational School

Strategic planning stems from a vision and mission for the organisation, resulting in strategic goals, each of which theoretically results in a set of strategies to achieve them. The implementation of these are realised by a value chain supported by support functions

such as Human Resources and Marketing, for example. The implementation is managed through a management structure. Strategic planning in a stable environment usually has a 3 to 5 year planning horizon, whereas tactical/control and operational planning has a shorter horizon (Cullen *et al.*, 2003; Porter in Thompson and Strickland, 2001; Johnson and Scholes in Ward and Peppard, 2002).

The criticism of the rational school has been noted and the issue of the unplanned effects and impact of a changing context is captured in Figure 5-2:

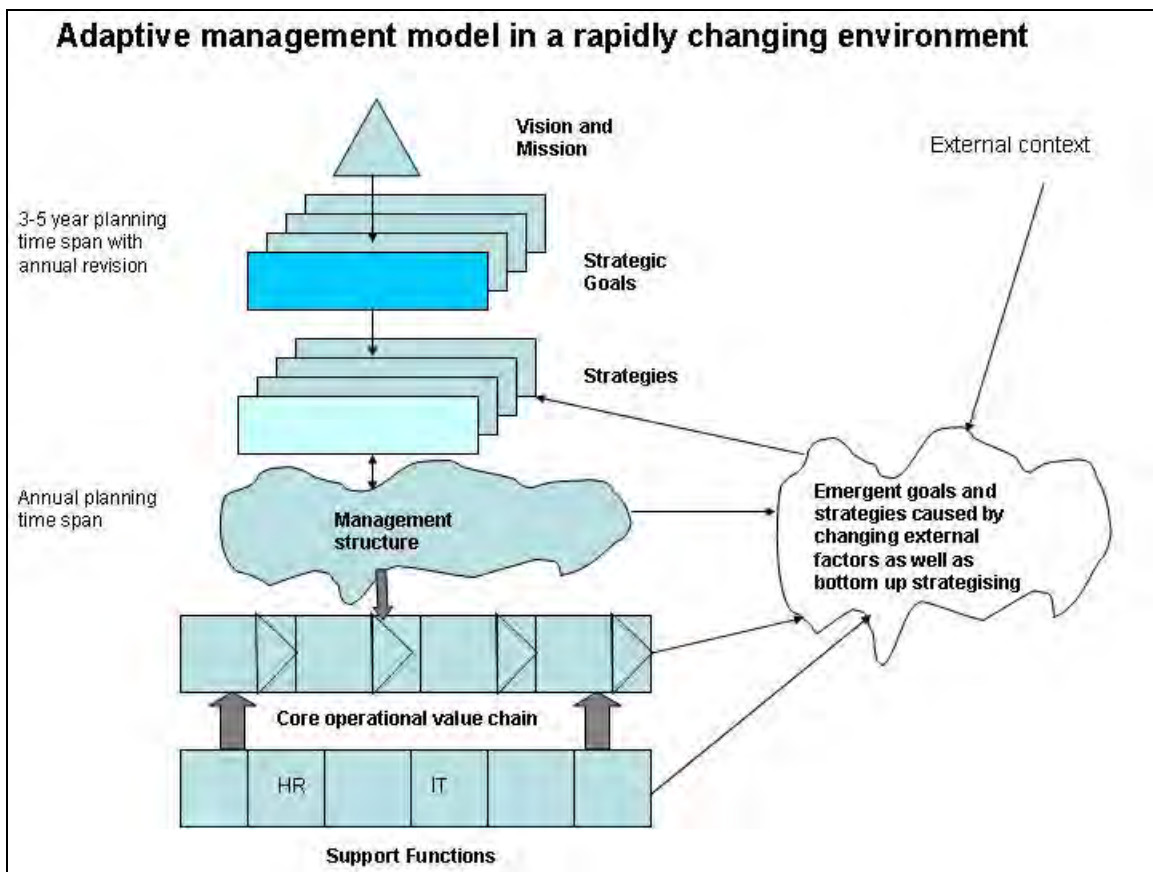


Figure 5-2 Adaptive model to counter rational criticism

In a changing environment, strategic planning is constantly being revisited, possibly on an annual cycle. Allowance is made for emergent strategies, as well as bottom-up strategising, depending on the management culture and structure. The effect of a

changing environment impinging on the organisation is shown. The organisation is accepted to be a complex adaptive system, although this is not shown specifically in the diagram. The line arrows indicate influence, whereas the block arrows indicate structural relationships of control and support.

### 5.4.2 IS/ICT support for organisations

The next two diagrams (Figure 5-3 and Figure 5-4 ) illustrate the role of the support functions in achieving the goals of the organisation. IT has been chosen as an example in Figure 5-4, but the diagram would apply for any of the other support structures.

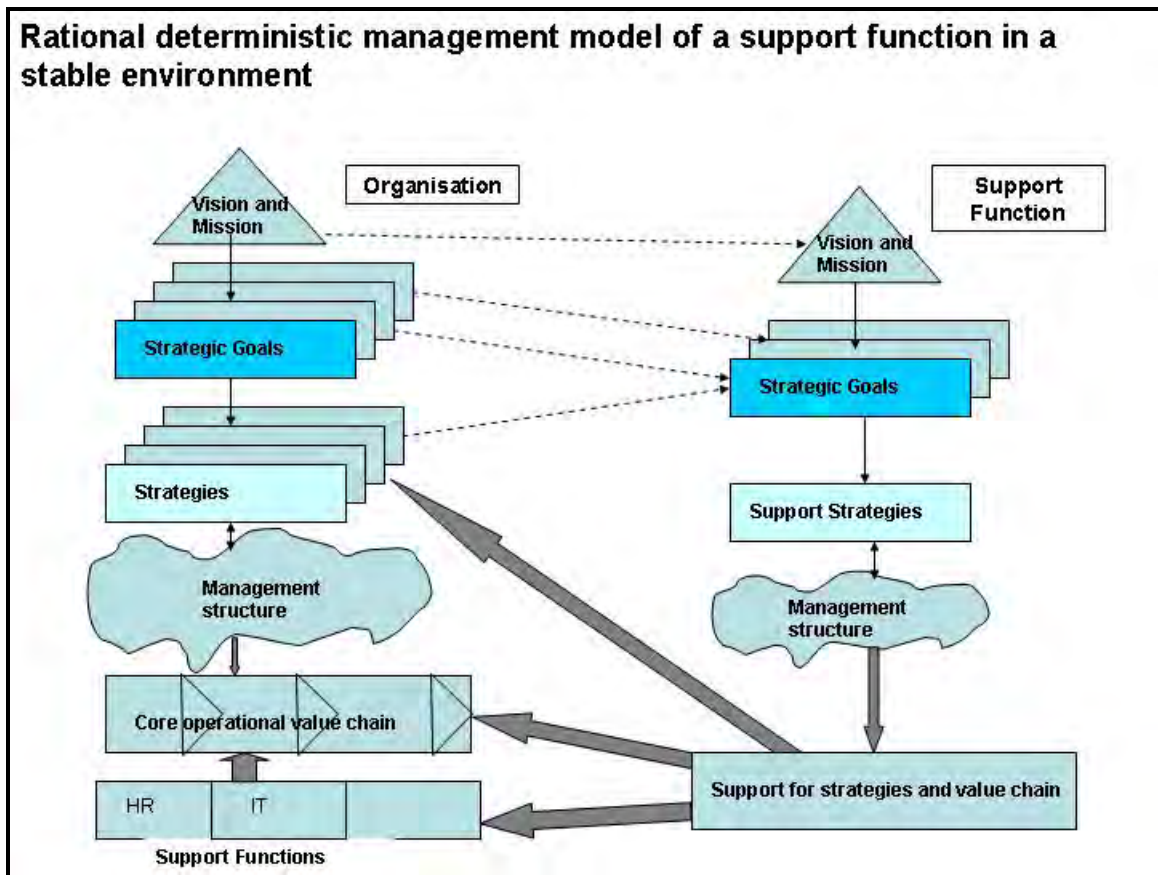


Figure 5-3 Support function expanded



In this diagram, a support function has been “exploded” to depict the management of the function and its support for the organisation.

The support function would theoretically have a mission and vision that supports those of the organisation, and similarly its strategic goals are informed by the strategic goals of the organisation. The block arrows from the support unit indicate support at strategic, tactical and value chain/operational levels, while the dotted arrows indicate desired influence.

In Figure 5-4, IT is specifically depicted, as well as the more chaotic environment. IT is a “special” case, as a support function, in that it has the possibility of affecting the goals and strategies of the organisation. This mutual relationship or influence is shown by dotted double arrows. The numerous examples of how IS/ICT has changed the focus, enabling a “competitive edge”, of organisations are well documented. IT support for the other support functions is also indicated.

Strategic planning (and management) for IS/ICT has been expanded.

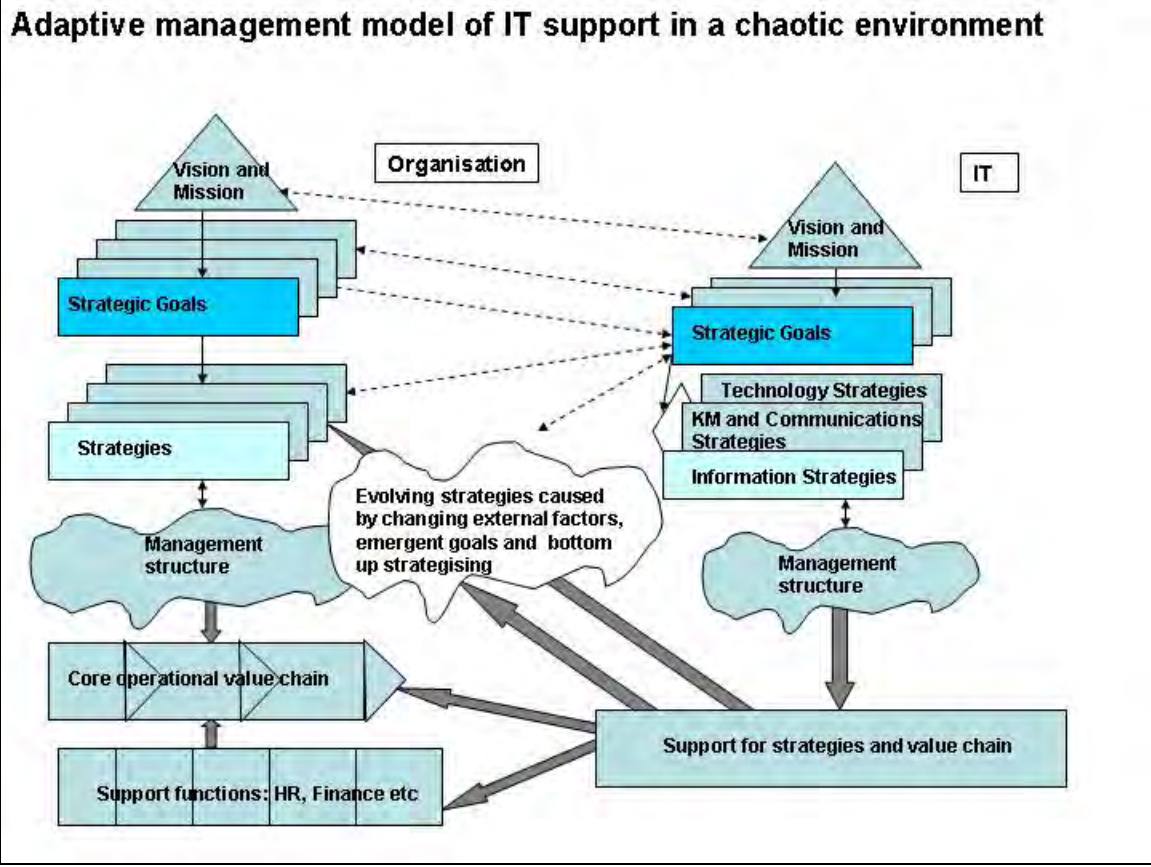
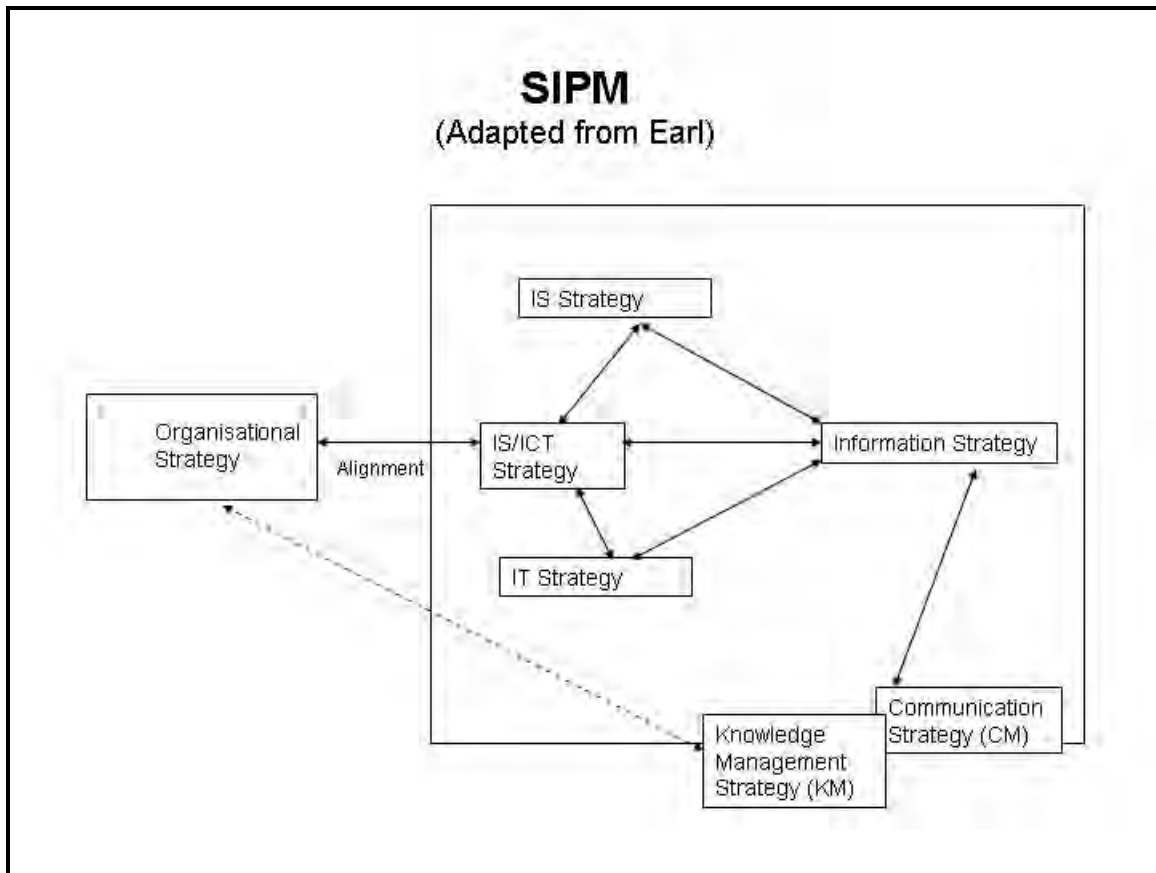


Figure 5-4 IT Support function for adaptive management model

The author’s adaptation of Earl’s model of IS/ICT planning and strategising is repeated from Chapter four and follows in Figure 5-5, which expands on the facets of IS/ICT strategic management.



**Figure 5-5 Roets' adaptation of Earl's model**

The figure differentiates Information Technology (ICT) Strategy from Information Systems Strategy and Information Strategy. Criticism of IS/ICT strategies has been that they have often been solely technology focused. Communication Technology is subsumed under IT Strategy (ICT). Communication and Knowledge Strategic Management are subsets of Information Strategy. Both KM and CM are broader than a purely IS/ICT strategy. Information Strategy per se is a more recent focus of IS/ICT strategy, and Knowledge and Communication have become more important with the boom in connectivity. In this research, Communication Management is viewed as closely intertwined with KM, but having a different focus.

### 5.4.3 The Gap

Disappointment has been voiced regarding the payback on what are often very expensive investments in IS/ICT. The “Gap” between what is promised or hoped for and the value of IS/ICT is often very large. Figure 5-6 depicts gap areas.

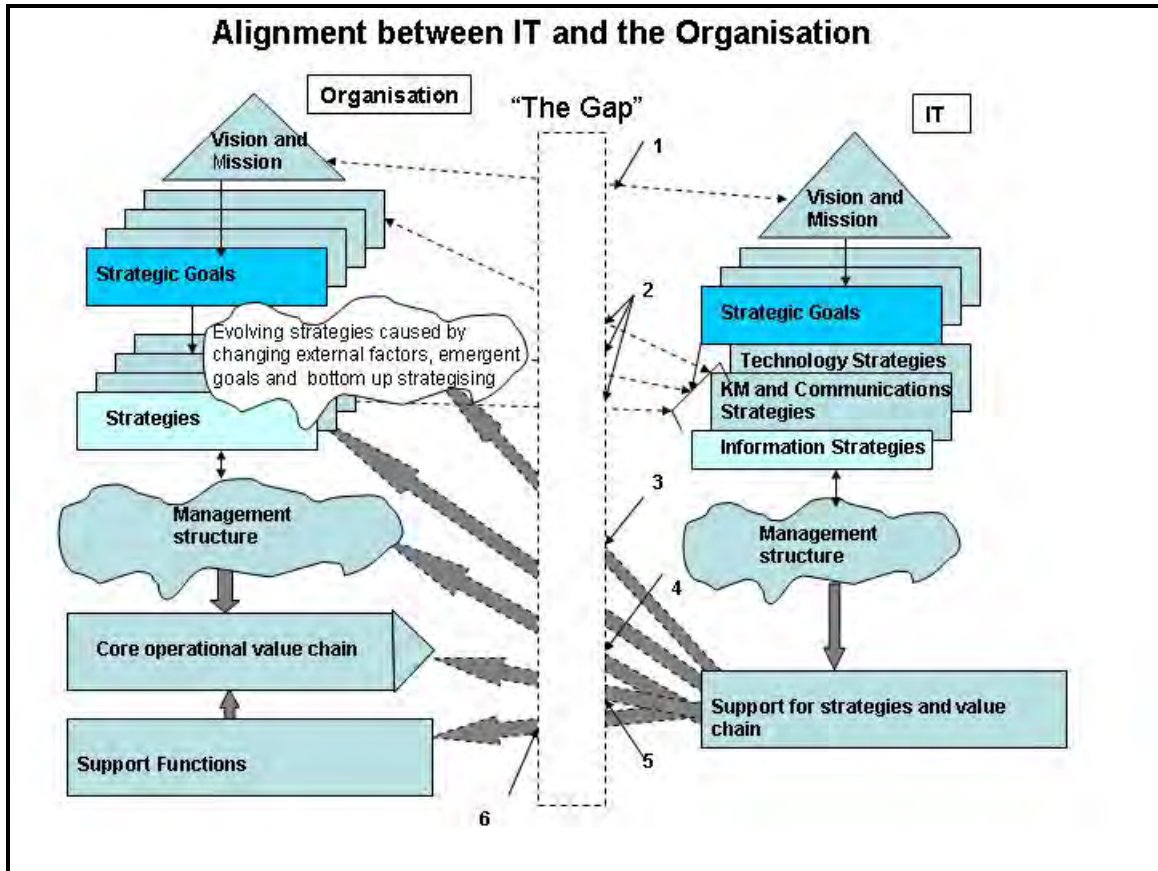


Figure 5-6 The Gap

The numbered arrows in Figure 5-6 indicate areas where this gap may be manifested.

The explanation of the numbered arrows is itemised in Table 5-1 :

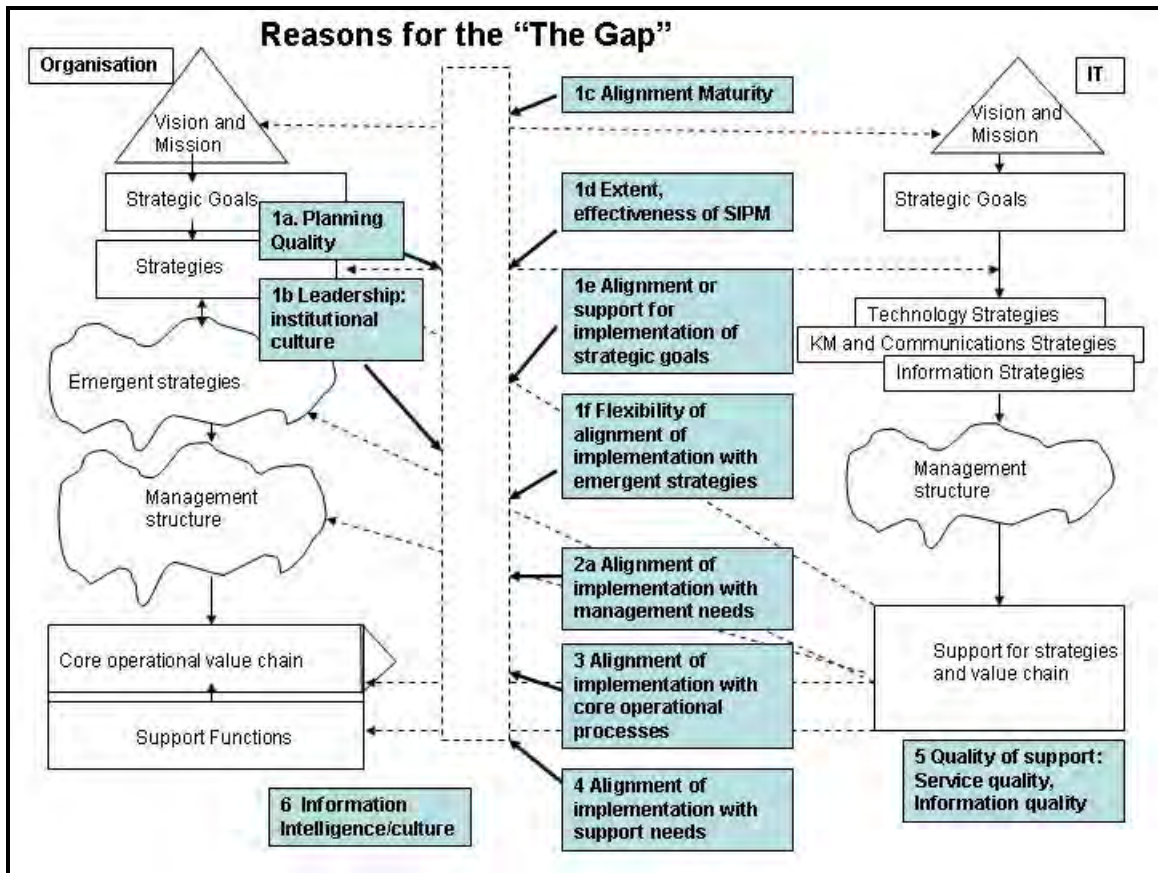
<b>The “Gap”</b>	
<b>Gap Area Number</b>	<b>Gap Details</b>
1	Possible misalignment between the vision and mission of the IS/ICT support function and that of the organisation.
2	A gap between the strategic goals of the IS/ICT support function and the strategic goals of the organisation, as well as the strategic planning process.
3	An operational gap between the actual functioning of the IS/ICT support function and the strategic goals they are meant to support.
4	A gap between the managerial informational needs and the IS/ICT support offered.
5.	A gap between the actual functioning of the IS/ICT support function and the informational needs of the core processes.
6.	A gap between the IS/ICT informational support required and provided for the support functions.

**Table 5-1 Gap areas**

Not shown in the diagram is the possibly problematic flow or capture of information from the support structures in order to provide higher level information.

#### **5.4.4 Reasons for failure**

Factors contributing to the gap are illustrated in Figure 5-7.



**Figure 5-7 Factors creating the gap**

An explanation of the diagram can be found in Table 5-2. The explanation is divided into strategic, managerial and operational factors, as well as the author’s proposed underlying universal factors (5 and 6).

<b>Factors contributing to the gap</b>	
<b>Strategic</b>	
1a.	The quality/extent of strategic planning is important. Strategic plans that start and end with a vision and mission statement, with ill-defined goals may be problematic.
1b.	In a changing environment, the culture or values of the organisation are important and strong leadership is needed to forge a common culture.
1c.	Often quoted, is the issue of alignment of strategic planning between the organisation and IT (Askling and Kristensen, 2000; Luftman, 2000; Luftman and Brier, 1999; Luftman <i>et al.</i> , 1999) – the so-called Alignment Maturity of an organisation.
1d.	The difficulty of the SIPM process is recognised, and also the difficulty of assessing the level of formalism required. This is related to the importance of IS/ICT to the organisation. The perceived importance of IS/ICT and the comprehensiveness of the planning is an indication of success.
1e & f	Whether the IT function can support the implementation of organisational change strategies, both planned for and emergent, can be a problem area. Flexibility/responsiveness in a competitive world is required. Technology has a long life span, and this may limit flexibility.
<b>Implementation/ management support</b>	
2.	IS/ICT support for information needs is crucial for effective decision-making. In order to enhance flexibility, a networked structure has been recommended, and for this to be successful, information flow is vital. This requirement (as 1e&f) may be hindered by a cumbersome system and the inability to meet non-standard information needs.
<b>Implementation support / operational</b>	
3.	IS/ICT support for informational needs at operational level is vital. Although this is not usually an area of concern, it is an area where there may be information produced that is unused. It may also be an area where technology could be used more innovatively.
<b>Support function</b>	
4.	IS/ICT support for functional units is vital at the “factory” level. This is usually not a problematic area.
<b>Underlying requirements</b>	

5.	Quality of the information at all levels is necessary, and this is usually obtained through quality of management of the IT function, providing quality service.
6.	Information culture: The author suggests that the level of information intelligence that exists in an organisation is a major gap factor. Employees who are not computer literate, who do not use technology for communications (as well as other media), who do not appreciate the importance of gathering and maintaining “good” data, and who do not have the skills to access organisational information can be a further gap factor. Ownership of the quality of data is vital.

**Table 5-2 Reasons for the gap**

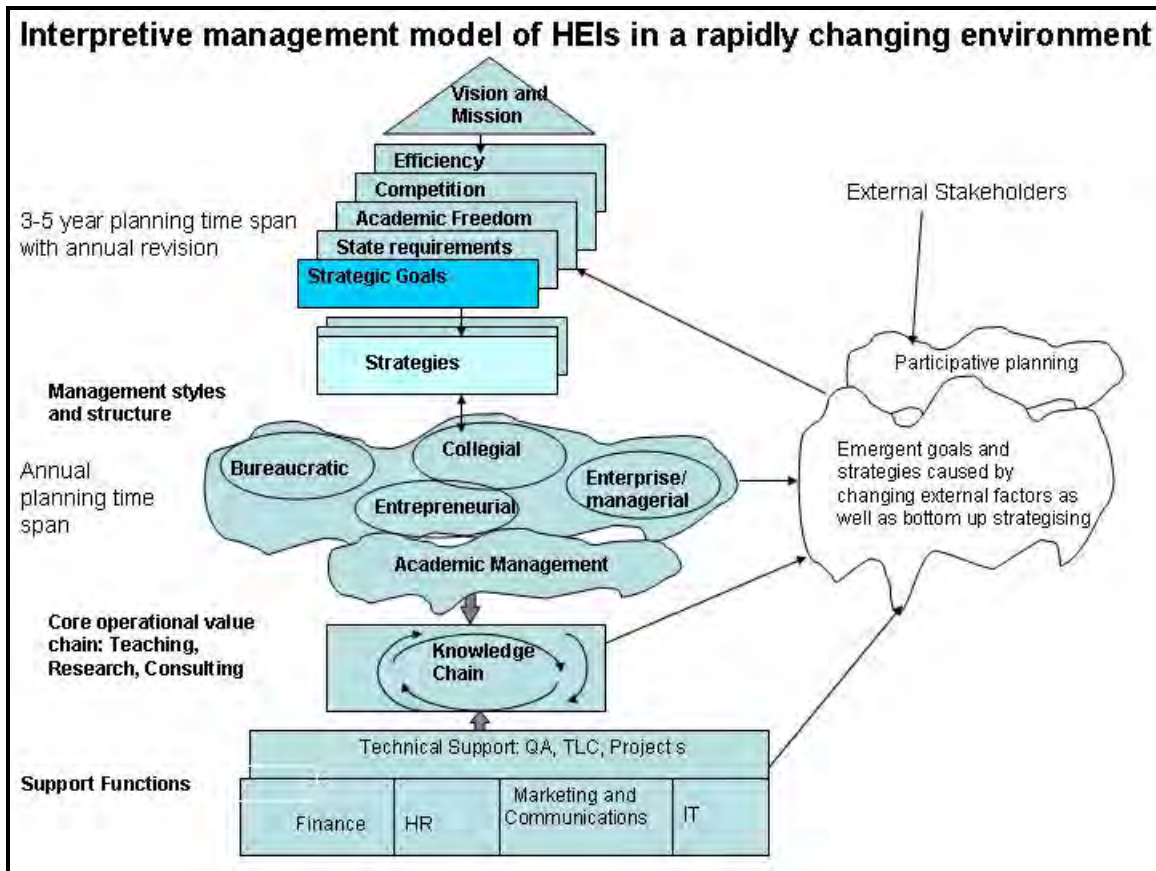
Points 5 and 6 emphasise the importance of the quality of information, as well as the “information behaviour” of the organisation.

### **5.4.5 HEIs and Management Theory**

The previous sections discussed the model of IS/ICT support for generic organisational management, the gap areas and a non-exhaustive list of possible reasons or impact areas of the gap. This section adapts the management model of organisations to HEIs, and then examines South African specifics that may affect HEIs.

In Figure 5-8, the management model of Figure 5-7 is adapted to fit HEIs (using Mintzberg’s model of a professional organisation and the adaptation of Fjelstadt’s service):





**Figure 5-8 Management of HEIs**

The areas of difference between HEIs and “normal” business organisations include:

- HEIs are restricted in their choices for strategic planning by the range of stakeholder interests as well as State legislation. In addition as a result, they operate on a participative basis, both externally, and internally (by tradition) (Rowley *et al.*, 1997). This participation, they suggest, predicates extensive communication between the internal and external stakeholders and communities for success.
- The goals of competing units are arguably more pronounced than in business organisations.

- HEIs have more muddled management structures, as discussed in Chapter four. Although Dobson and McNay's grid (1996) shows different positions for the management style of the HEIs, the author maintains that most HEIs have features of all the four management styles and structures, often competing. This makes the leading of such organisations difficult. In addition, academics increasingly have to carry a larger responsibility for academic management and administration unlike professional bureaucracies.
- The value chain is not as simple as Porter's original model for a manufacturing environment (although this has been extended and adapted both by Porter and other writers for other organisations). Stabell and Fjelstad's (1998) value chain has been adopted and adapted for HEIs in Chapter five (shown in simplified fashion in Figure 5-8). The suggested core operations in the value chain are repeated in Figure 5-9, where the shaded areas indicate areas where IS/ICT can provide support. The dialogue that exists between students, academics and knowledge is facilitated by technology according to Rowley *et al* (1997):

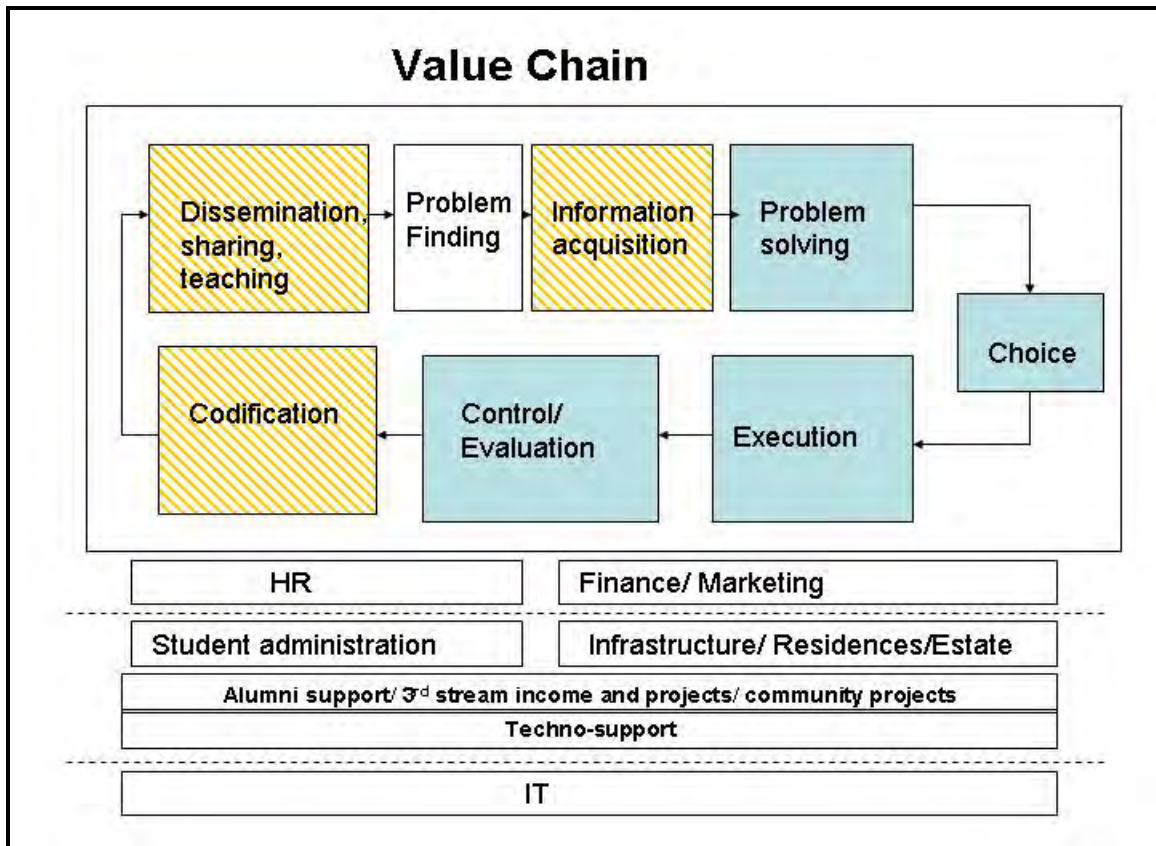


Figure 5-9 HEI Value chain expanded from Stabell and Fjelstadt (1998)

- The techno-structure referred to by Mintzberg (1979) is reflected in the functional support structure. This is an extra layer of support, the components of which sit somewhat uneasily as service departments and units.

#### 5.4.6 HEIs in SA and IS/ICT support

The author's view of the issues of importance for HEIs specifically in South Africa is illustrated in Figure 5-10. The IS/ICT issues specific to SA with respect to HEIs are also indicated (in the dotted blocks on the right of the diagram). These issues may contribute further to the gap shown in Figure 5-7.

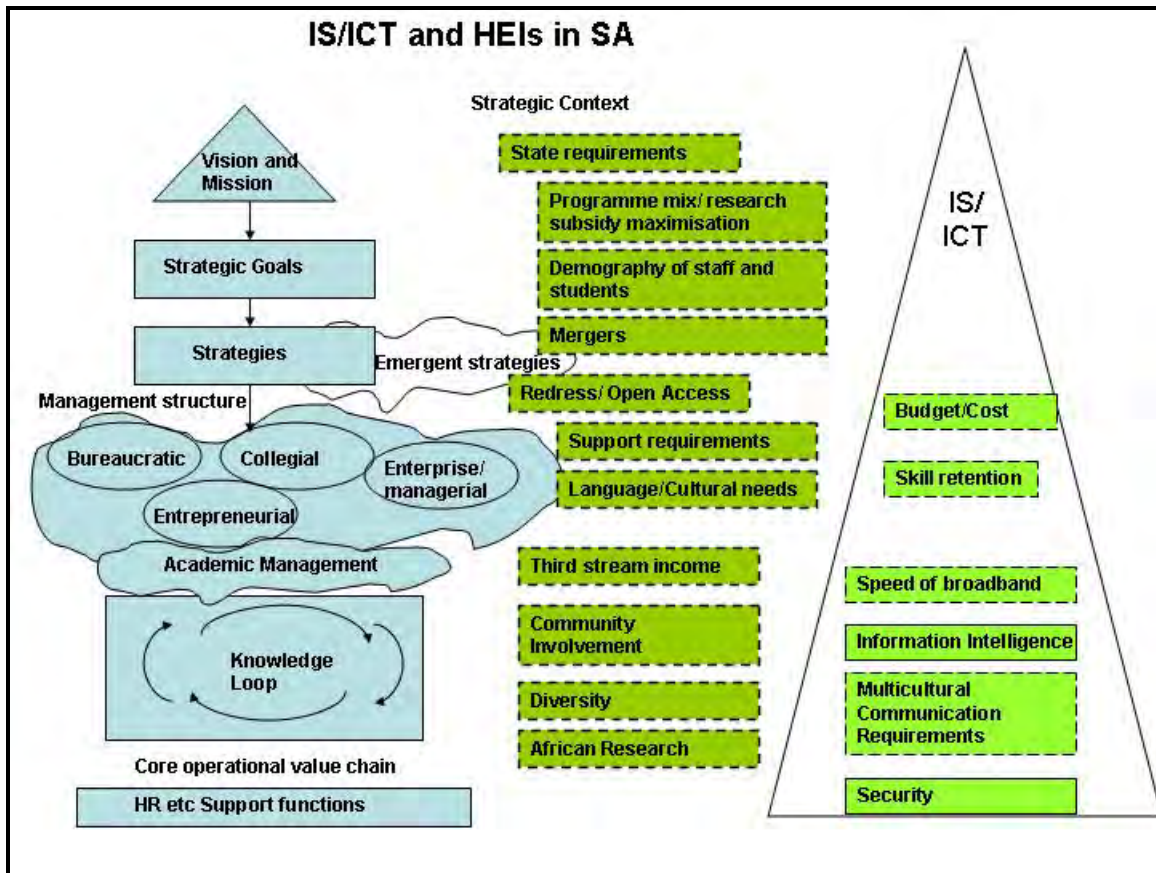


Figure 5-10 SA specifics

The strategic context of HEIs in SA has been examined in Chapter two. As discussed, some of the issues now faced by HEIs are driven by State requirements. Others are driven by a moral or financial imperative, in the main unique to SA. These issues are not discrete – for example, student demography has implications for cultural interventions, and open access and mergers have implications for support of under-prepared students. Community involvement could involve redress on a wider scale. Research may be peculiar to South Africa in that areas of research are under-represented, for example research in management issues related to the African context.

The IS/ICT factors pertinent to SA are shown on the right as derived from the author's and Bosire's surveys (Bosire, 2003; Roets, 2003 – Appendix A).

## **5.4.7 Transformation**

This section examines the issue of transformation and proposes IS/ICT support specifically for transformative change.

### **5.4.7.1 Organisational change**

From the discussion above:

- A network structure is held to allow organisations to react more rapidly to change imperatives
- Effective processes are necessary for an organisation to function properly. This is self-evident, as a malfunctioning organisation is unlikely to be able to handle complexity and change
- A learning organisation is held to engender flexibility.

### **5.4.7.2 HEI Transformation and Possible IS/ICT Support**

Figure 5-11 depicts HEI transformational issues and IS/ICT support areas.

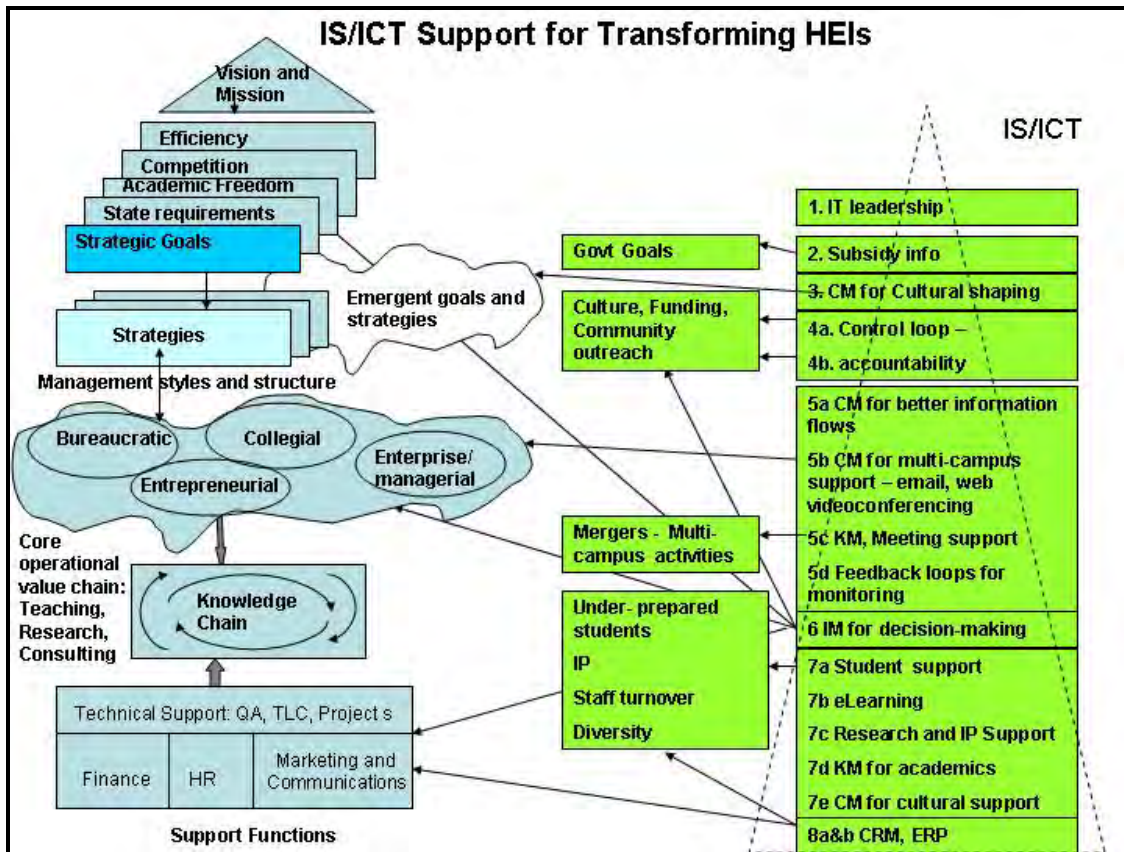


Figure 5-11 HEI transformational support

Given the ability to support the organisation successfully in a changing environment, IS/ICT should also support the unique needs of an HEI in a transformational period. A discussion of the diagram (especially referring to South Africa) follows.

#### 5.4.7.2.1 Strategic support

In order for organisations to transform or cope with change successfully, accepted wisdom is that organisations should ideally have strategic management in place.

An organisation may have more or less formal strategic objectives in place, especially related to change. These change objectives are for competitive purposes, but may be for survival in a changing environment. In public organisations, there may be pressure to change towards providing a better service, rather than an improvement in the profit goal

more common in private organisations. The planning process should be as flexible as possible to allow for turbulence as well as emerging strategies, and have feedback loops in place. Organisations that plan for change, and are able to adapt their strategies to allow for emergent strategies, are more likely to change successfully.

Strategically HEIs do not, or should not, operate in any way different to other organisations. The goals of strategic management may be different, but the processes are similar. The only difference noted by researchers is that of conflicting goals of sub-units. IT can add value by increasing top management's ability to scan the environment through the use of the web. Specifically for HEIs, it has been suggested that to minimise the clash of goals better communication between sub-units and between sub-units and organisation management is required, thus IS/ICT has a role to play to facilitate this communication (CM) (Not shown in the diagram).

SIPM and IS/ICT support for strategic planning should also be no different to that occurring in other organisations.

IT leadership is required by all organisations for the exploitation of new technologies. Since the core value chain in HEIs is information intensive, this leadership is more critical (Point 1 in Figure 5-11).

Government requirements shape the strategic context of HEIs, and IT's role here is in providing the statistics to indicate compliance (Point 2 in Figure 5-11).

In a transforming HEI, and especially after a merger, there may strong sub-cultures within an organisation (HEI). HEIs that are expanding into different countries may have a similar problem of different cultures. Leadership is required (as it would be for all organisations) to create a unifying culture. IS/ICT supported CM can facilitate reaching consensus and propagating common values and culture (Point 3 in Figure 5-11).

Community outreach and consulting projects, as well as projects to raise third stream income, need systems to support them, and to provide a feedback/ control mechanism (Point 4a and 4b in Figure 5-11). These systems should of course provide quality management information. This underlies all the information provided (Point 6 in Figure

5-11) indicates the quality aspect, but in order to diminish the clutter of arrows, some of the links are not shown).

#### ***5.4.7.2 Managerial support***

The flexibility of the organisation allows it to change as the context changes. Decision-making effectivity and efficiency are hallmarks of a flexible organisation, particularly those operating in an entrepreneurial style, and such organisations are usually organised according to a network/matrix structure.

At this level of management planning and control (in Anthony's model), some of the peculiarities of HEIs are brought to the fore – a mixture of different management styles is an example. Committee decision-making poses decision-making speed as well as effectiveness problems (as well as having advantages). IS/ICT has the potential to improve communications and thus ease transitions from one management style to the next (Point 5a in Figure 5-11). IS/ICT has the possibility of improving the traditionally slow decision-making processes of HEIs by faster and more targeted information flows (Points 5a, 5c and 6 in Figure 5-11) as well as using technology for managing the voluminous documentation required for meetings (Point 5c in Figure 5-11).

An inherent paradox exists regarding the flexibility of information systems to support a changing organisation, especially with respect to ERP systems, where the IT systems have the potential to hamper change.

With devolved decision-making there is an associated need to reduce risk and maintain trust. Greater transparency of decision-making and greater access to information will remove some of the distrust occurring in HEIs between administration and academics, as well as the built in distrust by academics of managerialism (Point 5a in Figure 5-11).

Given the mergers that have taken place, many have increased the number of campuses per institution, with attendant distance problems. Multi-campus management can only occur successfully through the full exploitation of the communication possibilities



offered by technology such as email, videoconferencing and web sites (Point 5b in Figure 5-11).

Monitoring of implementation is an important part of strategy implementation, and IS/ICT can provide the vehicle for this - part of the cybernetic loop in a complex adaptive system (not unique to HEIs). However, a problem occurring in HEIs is the follow through on implementing Faculty and Senate decisions, and feedback loops to monitor this implementation could be provided by IS/ICT (Point 5d in Figure 5-11).

Academics are being obliged to perform more managerial or administrative duties, especially by HoDs and Executive Deans. Support could be provided by IS/ICT in terms of systems to provide the necessary quality information to perform these tasks (point 6 in Figure 5-11).

#### ***5.4.7.2.3 Value chain***

The increasingly diverse academic backgrounds of students has been occasioned by mergers and incorporations, demography requirements, as well as the greater proportion of foreign students, and this requires support. IS/ICT supported Communication Management can provide support through publishing material possibly in different languages (Point 7a in Figure 5-11), as well as providing eLearning possibilities to enrich the students' learning experience: technology may be effective with dealing with a greater range of backgrounds and abilities of students, as well as language differences (point 7b in Figure 5-11).

IS/ICT support for the value chain is vital. IS/ICT is seen as crucial in terms of fostering knowledge capture and sharing. The support for research and management of intellectual property is increasingly being examined (Point 7c in Figure 5-11). The greater focus on research implies that there should be systems in place to support research and provide both research resources and management information. eLibraries play a vital role.

Staff turnover can be alleviated by IS/ICT supported Knowledge Management. This applies particularly to teaching activities and the capturing of knowledge related to courses (Point 7d and a subset of 7c in Figure 5-11). The problem of overburdened staff with unmanageably large class sizes implies a greater use of technology – eLearning (Point 7c in Figure 5-11). IT support for eLearning (although not the focus of this paper) is an area where much research is being conducted.

Cultural diversity of staff and students can be addressed through communication management supported by IS/ICT. The intranet is a prime vehicle for this. IT may support informal communications in order to “homogenise” the culture of the HEI (Point 7e in Figure 5-11).

#### ***5.4.7.2.4 Functional and techno-support***

The need for information systems to support functional units in terms of MIS and transactional data is obvious. In the case of mergers, the need to unify systems and transport information is a prime requirement. Student services functions are unique to HEIs and efficiency and effectiveness in this area are crucial – these systems interface with, for example, the finance systems, and serve as a litmus test of the efficiency of the organisation. The processes are supported by information systems which could be home-grown systems or ERP systems. The processes and systems are also the basis of CRM systems (Points 8a and 8b, and 6 in Figure 5-11).

Another area requiring support is student activities that are non-academic in the strict sense – examples are SRC and societal functions. These need MIS-type information of a similar nature to the functional units (Point 6 in Figure 5-11).

## ***5.5 In summary: Antecedents of successful transformation***

### **5.5.1 Model of IS/ICT support for HEIs**

The model to represent antecedent factors for successful use of IS/ICT to support HEIs in a period of change can be found in Figure 5-12.

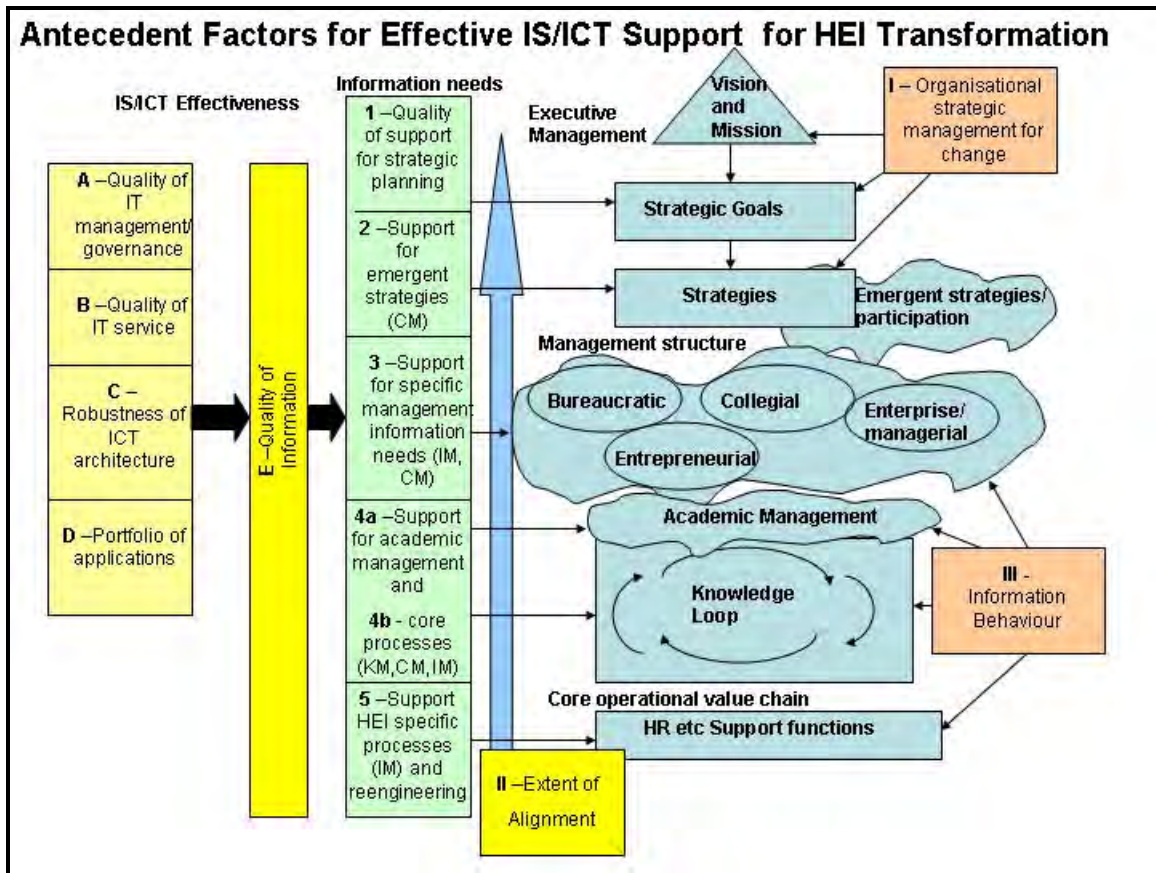


Figure 5-12 Analysis Model/Framework: IS/ICT, HEIs and Transformation

### 5.5.2 Strategic Management – planning for transformation

The quality of strategic planning is important for the organisation and for strategic management regarding change (Point I in Figure 5-12). In the South African context this would need to address State requirements, redress, equity access, throughput, demography, mergers, employment equity, AIDS and multiculturalism.

The quality of planning for the IT function is equally important (Point 1 in Figure 5-12) (supported by the work of Brown and Motjoloane (2005)). The strategic importance of IS/ICT determines the level of formalism of SIPM, as well as the formal level of alignment. The correct balance leads to successful planning. Research suggests that the

IT Director's reporting structure is one indication of the actual (rather than espoused) level of importance of IS/ICT in the organisation.

Quality of planning is also determined by the completeness and relevance of SIPM, that is, the categories that are included in planning. It is important for the SIPM to encompass the categories shown in Roets's adaptation of Earl's planning model – technology, information systems, information and knowledge and communications.

In addition, IS/ICT should be able to support emergent strategies and a flexible organisation. IT has the potential to act as effective sensors and control mechanisms in a rapidly changing environment for organisations viewed as “complex, adaptive systems”, thus allowing for emergent strategies. Supporting acceptable or sanctioned emergent strategies requires a balance between long term investments in IS/ICT and flexibility. Given the nature of HEIs (“individualistic”, as sometimes described), emergent strategies may be more prevalent and valuable than in organisations with lesser ratios of professional staff (Point 2 in Figure 5-12).

The view that IT should not lead business is by now an accepted backlash to the hype of the preceding decade. However, IT leadership should provide direction in the new possibilities afforded by IS/ICT, such that the organisational strategies be aligned with IS/ICT strategies also, and new processes and strategies may be explored (Point 2 in Figure 5-12).

In addition, it is the responsibility of top management to minimise conflicting goals occasioned by different unit or group cultures in the HEI. This can be achieved through effective use of the communication potential of IS/ICT (Point 2 in Figure 5-12).

### **5.5.3 Implementation support for transformation: tactical level**

Not only should IS/ICT support strategic analysis and planning, but should also support implementation of strategies. To do so requires processes in the organisation that will ensure implementation quality, but IT should support the management of these processes

with quality information, where quality implies focused information, and effective service (Point 3 in Figure 5-12).

IS/ICT has the potential to enable a flexible organisation primarily by making (quality) information available for devolved decision-making.

IS/ICT can improve decision-making speed and effectiveness (which is again a feature of a flexible organisation), by making information for, and resulting from, decision-making more transparent and accessible. For HEIs, it is important to improve effectiveness and efficiency of committee-style decision-making. Furthermore, greater transparency of decision-making and greater access to information removes some of the distrust in HEIs between administration and academics, as well as the built-in distrust of academics of managerialism. In HEIs, this implies that committee decisions can be made more “honest” with tracking of implementation.

Regarding the arguably unique management structures of HEIs, IS/ICT has the potential to improve communications and thus ease transitions from one management style to another.

Monitoring and control are management tasks. Given devolved decision-making, a greater need for checking/control is required as inexperienced decision-making could be dangerous. In SA, given employment equity (EE) requirements, inexperienced decision-makers are appointed. KM enabled by IS/ICT can be used to support more routine support unit work. IS/ICT can do automatic exception checking which sets up an unbiased level of control. IS/ICT’s ability to make decisions more transparent can also reinforce accountability. Community projects and income generating projects require management information, as a minimum level of support.

#### **5.5.4 Support for core processes**

Academic management requires informational support which IS/ICT can provide (Point 4 in Figure 5-12).

Since the core value chain in HEIs is primarily a knowledge based value chain, IS/ICT is well-placed to support the value chain, and any process reengineering that the may be attempted on the value chain. Flexibility of IS/ICT support would be valuable in this respect. In SA, core processes must cater for the support needs of the diversity of the student body in terms of learning styles, language, and culture. Explicit KM supported by IS/ICT can support teaching by inexperienced lecturers.

In mergers, support is required when merging or changing course structures – flexibility is necessary.

### **5.5.5 Support for support functions**

The unique administrative processes of HEIs require systems, for example, for student administration (Point 5 in Figure 5-12). HR is generally a neglected unit of support, and efficiencies brought about by IS/ICT would be welcomed. The use of IS/ICT in process engineering is well documented. Flexibility is also required in order to adapt to changing student demands. Modularity of courses increases the administrative load, but improves the customer-centricity of the organisation as well as possibly increasing throughput; hence the systems should be able to allow for this type of flexibility.

### **5.5.6 IS/ICT Effectiveness**

The effectiveness of the IS/ICT function is a necessary condition to enable the support outlined in the section above.

Firstly (Point A in Figure 5-12), the managerial effectiveness of the function as epitomised by the reporting line, the budget and staffing adequacy, as well as governance structures for compliance is necessary.

Secondly (Point B in Figure 5-12), the service quality delivered is important. This is true of all service departments, but with IS/ICT forming such a vital role especially in core processes, that is in an information intensive organisation, the need for quality service is imperative.

Robustness of the IS/ICT infrastructure is the third consideration (Point C in Figure 5-12). The reliance on email and the Internet is becoming universal in HEIs and a robust architecture with efficient backup, recovery and disaster recovery is vital. Responsiveness can only be effected if the IT infrastructure that is put in place is as robust and sound as possible and provides a platform that will allow/enable flexible/rich future use (Ward and Peppard, 2002).

Finally, the systems required by the various levels of staff needs to be as complete as possible (Point D in Figure 5-12), especially with regard to the specific needs of HEIs in terms of student systems.

For HEIs in SA, special IT constraints that exist such as skills shortages, broadband speeds and cost, budgetary constraints and cost of technology need to be carefully considered.

### **5.5.7 Information quality**

The quality of the information provided is vital (Point E in Figure 5-12). This is a truism, as the consequences of bad information quality, equating to organisational risk, may be huge. Quality of information is indicated by several factors: accuracy, comprehensiveness, fit-for-purpose, replicability, availability, timeliness and so forth. Reach (diffusion) and richness (Reed), as well as ease-of-use through the application of sound human-computer interaction principles are further attributes of quality information. Security, the possibility of information overload and nuisance value, as well as compliance with privacy of and access to information legislation needs management. Regulations have added to this list with access and privacy factors. The quality of information in an information-intensive organisation such as an HEI should be sacrosanct.

### **5.5.8 Alignment**

Alignment of IS/ICT and organisational strategies is important at both the planning and analysis level, and at the implementation level (Point II in Figure 5-12). Shown in this

diagram, the concept encompasses the provision of information at all levels to meet the needs of the organisation (changing or stable). This factor is tied closely to information quality which also underlies the effectiveness of information provision (and alignment).

### **5.5.9 Information behaviour**

Information provision is important, but information usage is equally important, that is the ability of the organisation to access and use electronic (and other) information (Point III in Figure 5-12). The author has proposed that “information literacy” is a necessary factor for a learning organisation, supported by McKinney and Whiteside’s report (2006) on media usage for distributed organisational relationships.

Organisational employees should be sufficiently computer and, more importantly, information literate to be part of a learning organisation. Ownership of the quality of information is necessary.

For HEIs, information and computer literacy is not a given. For example, senior academics and administrative staff have reportedly varying levels of literacy. In South Africa, the levels of computer literacy are arguably lower than elsewhere in the developed world.

### **5.5.10 Analysis framework**

The analysis uses the proposed model and examines the suggested antecedent factors (Points 1 to 5, A to E, and I to III).

## **5.6 Conclusion**

Based on the literature, a model of antecedent factors for successful support of changing HEIs in SA has been proposed. At a strategic level, the difference between HEIs and “normal” business organisations is not marked in terms of IS/ICT support. However, IS/ICT support can alleviate problems or use opportunities occasioned by the peculiarities of HEIs’, for example, management styles and decision-making. Support for the peculiar value chain processes of HEIs is also a possibility.



Two of IS/ICT's salient features are the ability to create cybernetic loops and improve communication, and these features are captured in the model.

The next chapter describes the research method used to corroborate the model.

## **Chapter 6 Research Method**

### **6.1 Abstract**

The research method used for this study is described and substantiated. A positivist case study method is used, based on interviews and triangulated with published material (print and electronic) as well as quantitative surveys.

### **6.2 Introduction**

It is commonly asserted that researchers should define their ontology and epistemology when conducting research. Most IS research has been based on a positivist philosophy. However, Information Systems researchers have increasingly focused on the social and organisational issues of information systems and have used theories and methods from other disciplines such as management and organisational research, and have thus used a variety of research approaches. This research is situated within the organisational impact of IS/ICT.

This chapter examines IS research methods in general, case based research in IS/ICT with its attendant problems in achieving rigour, and the suggested phases of this type of research proposed by writers.

An exploratory study is mentioned and then the philosophy and methods used in this research are described.

### **6.3 Information Systems research perspectives**

Boland and Hirschheim (1987: xiii) note that Information Systems research “addresses a wide range of issues: technology, systems development, management of information systems as well as organisational and social impacts”. Various writers have discussed the effect of technology on society and organisations since the inception of computers. Swanson in Boland and Hirschheim (1987) divides research into three categories: the

individual, the organisation and the market, and further into the determinants and effects of the individual, organisation or market's use of information systems.

Robey and Boudreau (1999) and Sarker and Lee (2002) state that initially the theories regarding the change effects are perhaps too simply deterministic, with technology as an external agent. Later authors have argued for "more complex relationships between technology and the organisation" (as reported by Robey and Boudreau, 1999:168). Robey and Boudreau (1999) posit that four factors/theories affect the impact of technology: organisational politics, organisational culture, institutional theory and organisational learning (knowledge management). (Interestingly, they assert that researchers have made contradictory findings of the effects of technology such as: empowered employees versus oppressed employees; extended hierarchy versus reduced hierarchy; organisational rigidity versus organisational flexibility; and increase in staff versus downsizing. They posit that one of the reasons could be poor quality research.)

Thus IS research has progressed from a technical, to a managerial to a multiple perspective view, and from a harder technicist approach to an approach examining "softer" issues, and this, as well as the more varied underlying philosophy of researchers, has affected research methods and arguments. Mingers (in Mingers and Willcocks, 2004) writes in support that most empirical IS research is based on a positivist philosophy, but more recently an interpretivist stream of research developed based on post modernism (often) and using ethnography, hermeneutics, ethno-methodology and phenomenology, all aimed at individual and group subjectivity and at descriptions of particular experiences. Mingers writes that there have been diverse reactions to these different philosophical approaches – from assuming the dominance of one paradigm over the other(s); holding that the different approaches cannot be compared; to those that welcome the diversity.

These later research approaches are exemplified in the set of arguments regarding whether technology is culturally biased as opposed to culturally neutral.

In support of the former view, Winner (in Rodenacker, 1998) states that the features of technical systems shape society by the limitations and opportunities that it presents. This can be equated to the constructivist approach that asserts that technology is socially constructed, and that applications are culturally specific, or a critical theoretical approach that IT carries an agenda. Choosing a particular technology is thus choosing a particular form of political/organisational life – centralised, decentralised, democratic, autocratic, transparent, controlling or liberating. (As a simple example, the fact that English is largely the medium of computers would impose constraints on users.)

The opposing view that technology is culturally neutral and is a means to an end is supported by the instrumentalist view expressed by the claim that technology can be used for social or political goals as required (Ebersole and Habermas in Rodenacker, 1998).

Lee (in Mingers and Willcocks, 2004: 11) takes a synthesised view of Information Systems as the emergent result from “mutually transformational interactions between information technology and the organisation”. This appears to imply that we cannot predict the effects of the introduction of technology, and this is supported by Ellul who states that technical progress “... has three kinds of effects, desired, foreseen and unforeseen”, while even more anti-rationalistically, Postman states that the outcome of the use of technology is “wildly unpredictable” (Postman, Ellul in Rodenacker, 1998).

#### **6.4 *Epistemology for this research***

The purpose of this research is to examine HEIs in South Africa, and using the model proposed as a framework, to establish how IS/ICT can be used more successfully in support of change and transformation.

This research is approached from a natural science model, whilst acknowledging the difficulty of doing so in an organisational context. It follows Sarker and Lee (2002: 22) in adopting a “positivist” ontology that presumes that reality is immutable and that science and theories provide an approximation for reality. It embodies empiricist traditions, and relies on “publicly verifiable observable sensory data”, rationalist tradition using “logical principles”, and the critical rationalist position using falsification based on

Popper's work (Popper, 1973; Sarker and Lee, 2002). The purpose of the logical positivist or natural science model is to attempt to explain and predict by searching for causal explanations (Burrell and Morgan, 1992), and therefore to propose a solution that can be put into practice to create positive change for the organisation as a whole. In doing this research, a case study method is used.

The model is built based on theories from the management, educational and IS/ICT disciplines, and adopts a rational management theory perspective while acknowledging the need to take into account interpretivist criticisms and ideas such as emergent outcomes.

## **6.5 Case study research in IS**

A case study is “an attempt at describing the relationships which exist in reality” (Galliers in Galliers, 1992: 151). Dube and Pare (2003) note that case study research in the Information Systems field has been respectable for at least a decade although doubts were originally raised on the rigour of the studies conducted. Darke, Shanks and Broadbent (1998) state that the focus on organisational issues has led to an increase in the use of qualitative methods for Information Systems research and case based research is particularly suited and is stated to be the most widely used of qualitative methods. Yin (1994) warns that case study research does not have a good track record, but notes the fact that both qualitative and quantitative research methods can be used in this type of research.

### **6.5.1 Applicability and role**

Johnson and Harris (in Partington, 2002: 114) state that case study research is “of particular value when the theory base is comparatively weak and the environment under study is messy”. Yin (1994) mentions that case study research is useful when a “how” or “why” question is asked about a contemporary series of events over which the researcher has little control. Case studies produce what is often called “thick” or rich descriptions of situations that allow new ideas to emerge. According to Yin (1994), case studies fall into

three categories: descriptive, exploratory and explanatory. Eisenhardt (1989) suggests that exploratory case studies can be used to induct theories, while Yin holds that explanatory case studies are the preferred type for the formulation of stronger theories.

### **6.5.2 Problems**

The problems of using a natural science model in an organisational setting are well established. Lee (1989) notes four issues in the use of case studies: making controlled observations; making controlled deductions; allowing for replicability and allowing for generalisability – all features of the natural science model (Lee, 1989). Harrison (in Partington, 2002) concurs by writing that case study research usually has narrow relevance, by having the findings often specific to the few cases examined. Dube and Pare (2003) amplify by stating that exploratory research is less likely to have strong *a priori* theory or constructs, while explanatory research, or hypothesis testing research does.

The objective observer is also problematic, as there is undoubtedly interpretation that is applied albeit unconsciously. Darke *et al.* (1998) note the practical disadvantages of using a case study approach: data collection and data analysis are subject to the researcher's background and orientation, it relies heavily on the researcher's interpretation of events and documents (quoting Galliers and Bates, 1998) and data analysis may be difficult. Reporting on case studies is also difficult.

### **6.5.3 Methodology or process**

Dube and Pare (2003) propose three phases of case study research – design, data collection and analysis, although Bassey (1999: 69) states that case studies do not have “specific techniques” for generating data or analysis. Pare (2004) introduces a fourth stage: writing up of the report. Yin (1994) extends these stages into five steps: the study question(s); propositions (theory design); units of analysis; the logic linking the data to the propositions; and the criteria for interpreting the findings. These stages are supported by Durrheim (in Terreblanche and Durrheim, 1999) in his outline of the four

principles of research: outlining the purpose of the research; developing a theoretical framework for informing the research; probing the context in which the research is undertaken; using techniques to generate and analyse data.

Synthesising the recommendations, the following stages and activities in conducting a case study are proposed:

<b>Case Study Stages</b>		
	<b>Stage</b>	<b>Activities</b>
1	Design	Identify study question /issues  Theory design (propositions)  Establish units of analysis and relate these to the theories proposed  Devise criteria for interpreting the findings
2	Data Collection	Ask research question, generate and organise data
3	Data Analysis	Use the criteria established to interpret the findings  Summarise the data  Interpret the analysis
4	Report Writing	

**Table 6-1 Phases of case study research**

### **6.5.4 Rigour**

Although case study research may appear “easier”, rigour is important, but possibly less easily achieved than in natural science approaches. Case studies are criticised for lack of rigour. Various researchers have made recommendations in order to counter this. Dube and Pare (2003) and Yin (1994) state that quality of case studies relies on construct validity, internal validity, external validity and reliability. Yin makes suggestions for

rigour and identifies the stages at which this can occur. Dube and Pare also make recommendations for improving rigour. Their suggestions are combined in Table 6-2.

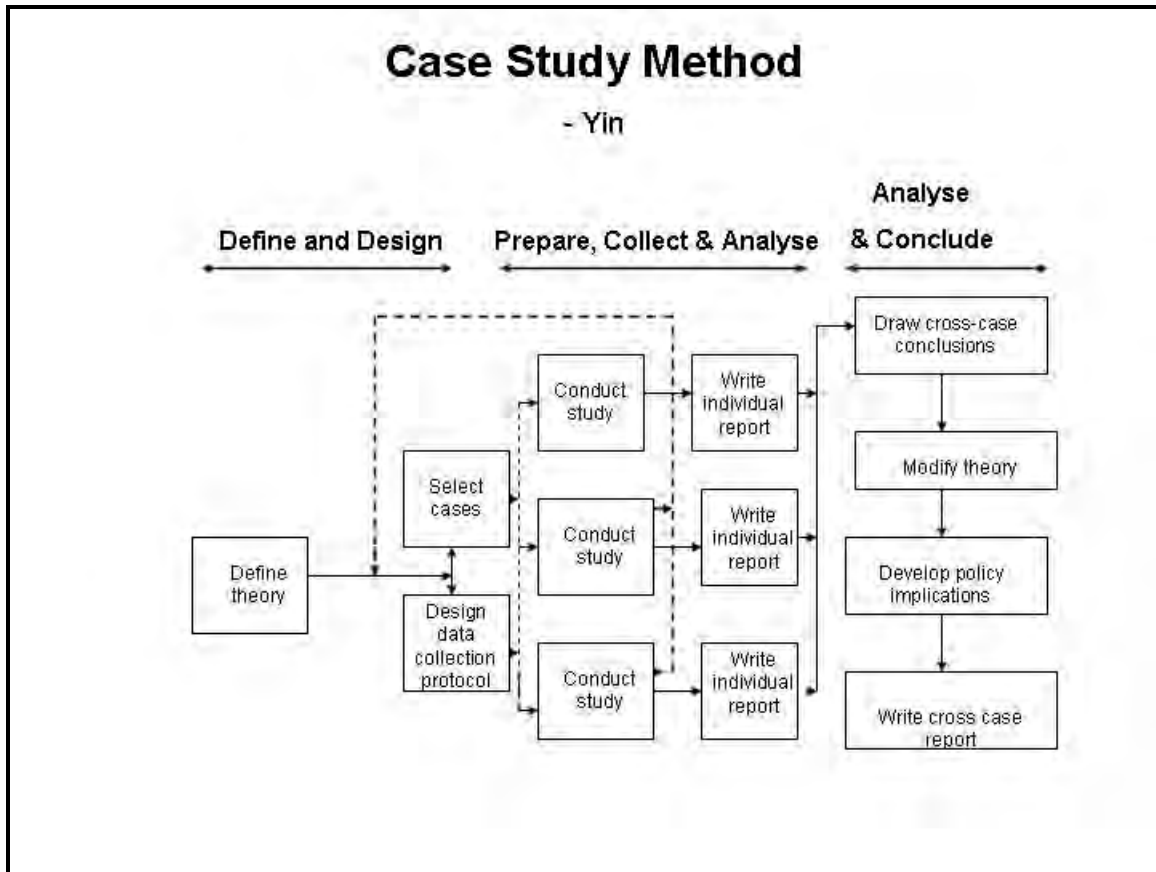
<b>Case Study Stages and Tactics</b>			
<b>Stage</b>	<b>Activities</b>	<b>Tactics to establish rigour</b>	<b>Validity</b>
Design	Identify study question and issues	Clear research questions, clear rationales for single or multiple case selection, and use of pilot studies	
	Theory design (propositions)	Based on pre-existing theories (if positivist) Explanation building	Internal Validity
	Establish units of analysis and relate these to the theories proposed	Replication logic Use of pilot studies	External validity
	Devise criteria for interpreting the findings		
Data Collection	Ask research question, generate and organise data	Use multiple sources of evidence Establish a chain of evidence Have informants review the report	Construct validity
		Case study protocol - a detailed description of the method is required Database usage Triangulation – different sources of evidence	Reliability
Data Analysis	Use the criteria established to interpret the findings; Summarise the data; Interpret the analysis.	Explanation building -provision of sufficient quotes to allow external observers to form independent judgement of validity of analysis	Internal validity
Report Writing	Clarity of organisation	Resonance - demonstrate an objective reality, the pursuit of generalisability, and a reflection on the	



		objectivity of the investigator Rhetoric - well organised Empowerment - to allow action by the reader Applicability - the readers should be able to apply the case to their own situation and draw inferences realised by producing a “thick” description Effective use of tables to summarise information	
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**Table 6-2 Phases and Rigour**

As stated, replicability and generalisability are problematic in case studies and are affected by whether a single or multiple case is used. In a single case study, the case in question represents a test case which represents a critical, rare or unique case. Multiple case research design offers more “compelling evidence” (Yin, 1994: 45) and makes the study more robust. Olivier (2004) states that cases should be chosen for theoretical or literal replication. This allows for cross-case analysis. Yin states further that a choice of multiple case studies should follow a replication and not a sampling logic.



**Figure 6-1 Case Study Method – Yin (1994)**

Figure 6-1 indicates the process of case study research proposed by Yin (1994).

Yin (in Harris, 2000) writes that the number of subjects required to build theory depends on the use of the findings. Comparative research requires at least two carefully matched cases and more if adequate triangulation is desired. Eisenhardt (in Harris, 2000: 758) suggests that at least four case studies be used to generate theory that can reflect the complexity of the situation, as well as being “sufficiently empirically grounded to be convincing”. This study uses three cases which have similarities, but are not matched in all aspects, as matching of cases is not possible given the small number of HEIs in South Africa. The cases chosen have similarities which are of interest for the analysis.

## 6.6 This research

### 6.6.1 Method used

This research uses the approach proposed by Yin, as shown in Figure 6-2.

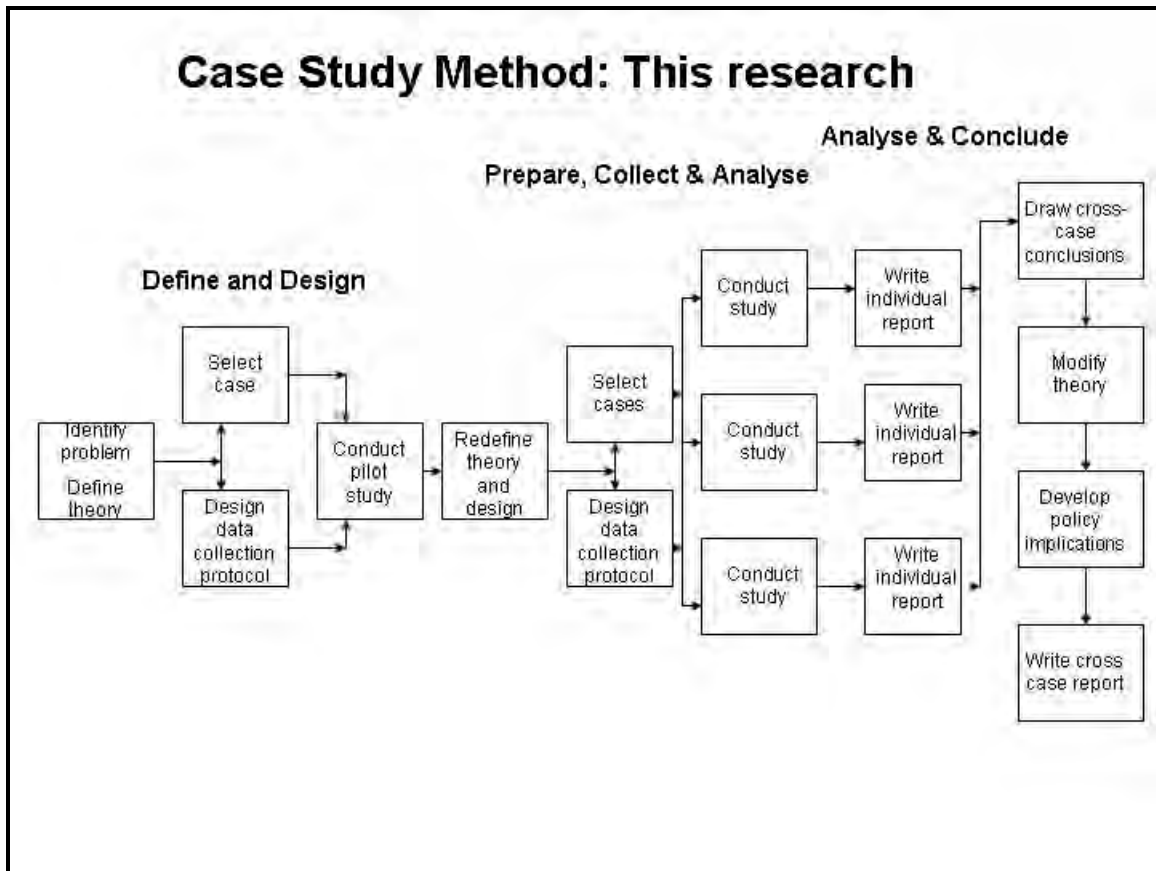


Figure 6-2 Case study method for this research (adapted from Yin, 1994)

As shown in Figure 6-2, a pilot case study is conducted, the theory is refined, and then cases are selected, the final protocol drawn up, the case studies conducted and written up separately, a cross-case analysis done and the theory checked against the findings. Theory modification may occur, and policy implications explored.

## **6.6.2 Method**

This research follows a positivist case study method using largely qualitative measures based on semi-structured interviews, but reinforced by “low reach” quantitative surveys, and published literature both printed and electronic with a view to a weak causal model. Table 6-2 serves as a guide to the process.

The research uses a literature review to build theory, and then an explanatory multiple case study approach to test the theory. The case study method is used for the reasons described above: that it provides a source of rich data which, in the author’s opinion, is more likely to approach an understanding of organisational factors than would a purely quantitative method.

## **6.6.3 Process - Design**

As per Figure 6-2, the problem area is identified, a case is selected and a pilot case study is conducted. Thereafter, following the positivist tradition, premises are identified (stated in Chapter one). The literature review, as reported from Chapter two on, is used as a basis for accepting or modifying the premises and for theory building. A model is proposed based on theories underpinning research in the context of HEIs, strategic and operational management, and IS/ICT in a changing environment. The units of analysis are encapsulated in the model.

For this research, three cases are used. The HEIs chosen are examples of three contexts that have similarities and differences. It would be difficult to find identical situations in HEIs in South Africa, but the factors considered are the state of transformation, size, context, merger impact, and history. Two of the HEIs are small Universities, both situated in a rural context. The one is a historically white University (HWU), and the other a historically black University (HBU). The latter is further characterised by having incorporated a satellite campus of a HWU. The third institution chosen is a HWU which has incorporated a campus of an HBU. This report thus used three cases, mindful that this may limit the generalisability of the findings. The first University selected is also used for the pilot case.

## **6.6.4 Process - Data collection**

Data is collected using different techniques/sources:

Semi- structured interviews are conducted, in most cases by the researcher, and are based on a protocol. The protocol links the questions to the relevant constructs, as suggested in Table 6-2. Using the same protocol for all three cases ensures reliability, as well as external validity. The techniques chosen are semi-structured interviews with key individuals. As far as possible, the individuals selected have the same positions/functions in the three organisations to ensure replication and reliability. The protocol can be found in Appendix B.

To eliminate observer bias through triangulation, established and published questionnaires linked to specific constructs are used as a means of probing attitudes. These are not applied to large sample populations for statistical analysis, but used for descriptive statistics and comparisons. The questionnaires used can be found in Appendix B and are used as a basis of discussion with respondents (Alignment Maturity, Servqual, EUCS, KMAT and Knowledge Management capability, as well as an Information Behaviour and a Portfolio analysis. The latter two were designed by the author based on literature and pilot research, while the others are established questionnaires). Eisenhardt (1989) notes that quantitative methods may be used as evidence, that is, numbers as well as words.

Interview transcripts are relayed to the respondents for verification and construct validity/reliability.

In addition, document analysis and web analysis is done. This ensured construct validity through multiple sources of data.

### **6.6.4.1 Target respondents**

Top Management, senior academics, and IT management are the main targets of the interviews. Lecturers, mid-level administrative management and students are also

interviewed opportunistically and selected questionnaires are applied to them. The questionnaires are aimed at different groups as explained further.

Top Management respondents include the Vice-Chancellors or Rectors (V-C), Vice-Principals (V-P) and or Planning Directors, Registrars, and Financial Directors or Registrars. Senior academics comprise Deans/Directors of Faculty and Schools, and Heads of Departments. IT Management is represented by Directors and senior staff members.

#### **6.6.4.2 Ethics**

Permission was obtained from the Vice-Chancellors of all three institutions to conduct the research. In the interviews, the respondents/interviewees are asked whether they wish to remain anonymous. The reporting is done by category of respondent and the respondents are coded for anonymity except where the comments are necessarily and importantly identified. Transcripts of the interviews are relayed to the correspondents and comments and clarification requested. While allowing for transparency, this also increases reliability.

#### **6.6.4.3 Coding**

The coding used in the report, as shown in the Glossary, is [ExecMgm] to indicate V-C and V-P status and members of the Executive Committee. [SAd] encompasses senior administrators such as Registrars and Support Unit Directors; [ITMgm] indicates IT management such as the IT Director, and [SAC] indicates Deans and HoDs. [Ac] indicates senior and junior lecturers, [Stud] indicate students, and [Ad] indicates middle level administration.

#### **6.6.4.4 Interviews and documents**

The interviews conducted by the researcher, are typically scheduled for 45 minutes (where possible, although a few are scheduled for 30 minutes). In almost all cases (except when there is equipment failure), the interviews are recorded for later note amplification. As per the protocol, the reason for the research is stated, as well as the

purpose of the questionnaires and the main focus areas. The interviews cannot follow a linear fashion, as digressions often give other insights. The recordings are stored electronically as are the different interview notes. In some cases, student tutors may be used to sit in on the interviews and their recordings are amalgamated with the transcripts for verification. This adds to the test for reliability.

The documents and web reviews are focused on the specific headings identified by the model and exemplified in the interview protocol. In two cases, the web provides intranet access also, while in the third case only external information is visible. Documentation for respondents includes annual reports, IT plans, and promotional material.

#### 6.6.4.5 Derivation of the protocol and measurement tool choices

The model to represent antecedent factors for successful use of IS/ICT to support HEIs in a changing environment is repeated in Figure 6-3.

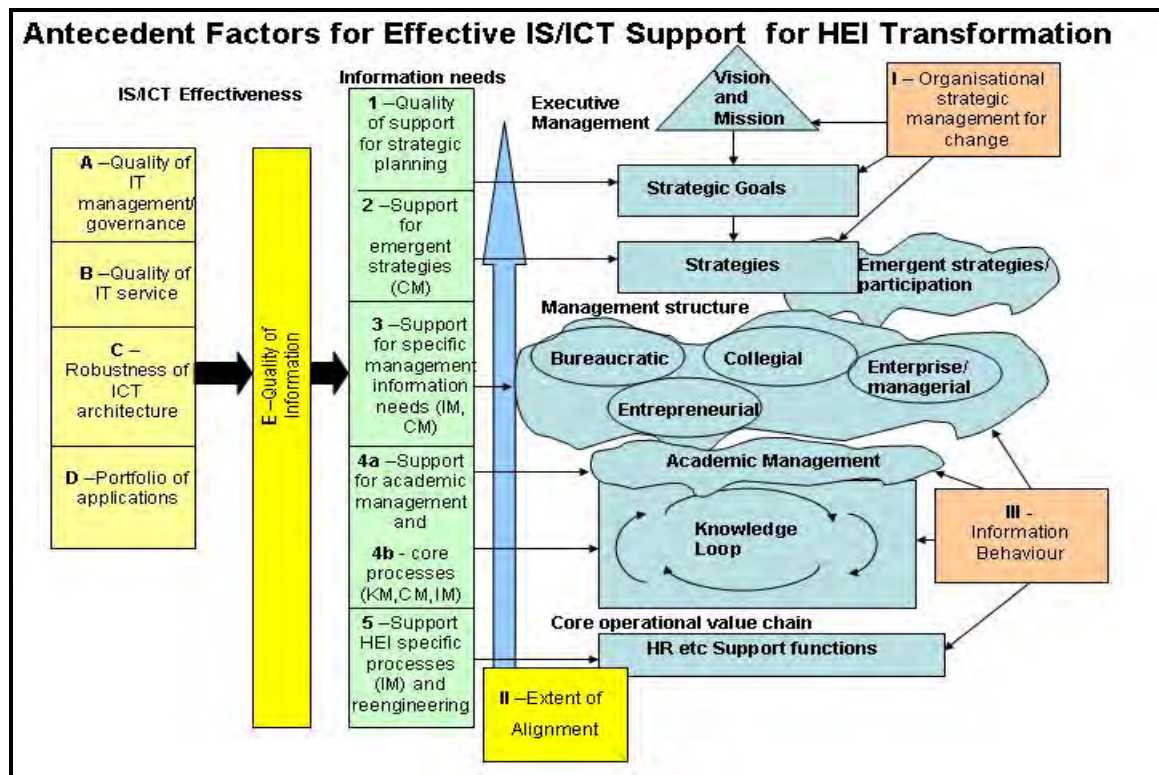


Figure 6-3 Analysis: IS/ICT, HEIs and Transformation – Roets (2005)

This is used to provide a framework and base for the research protocol.

### **6.6.5 Analysis framework**

The research protocol and questionnaires can be found in Appendix B. These are used to examine the factors (Points 1 to 5, I to III and A to D from the diagram above). The connection between the questionnaires and protocol is described in this section.

#### **6.6.5.1 Organisational analysis**

This part of the analysis examines the strategic focus of the organisation (Point I in Figure 6-3) with specific reference to its stance towards transformation (in the South African meaning of the term as well as that of the respondents).

The organisational context is examined by means of interviews (the protocol in Appendix B, Section B.1.2 is used), as is document analysis for the vision and mission, for example, of the chosen cases.

The way the organisation copes with change or is changing is examined by means of interviews with top management. Further standard questions are used in order to assess the strategic objectives (Appendix B, Section B.1.3).

The communication channels between executive management and staff and students are questioned (Appendix B, Section B.1.2).

What is understood by Knowledge management is examined (Appendix B, Section B.1.2).

How organisations cater for the specific South African issues, transformation and mergers, is elicited through interviews, and if they exist, documented strategic plans (Appendix B, Section B.1.3 and Appendix B, Q1.1 in Section B.2.1). The challenges of merging institutions and whether systems exist to facilitate this are examined through interviews. Support for more diverse multiculturalism of HEIs is examined in light of tacit KM. Web pages are used specifically for this. Documented email policies and possibilities are examined.



### **6.6.5.2 IS/ICT Strategic management**

This section examines strategic management of IS/ICT (Points 1 and 2 in Figure 6-3). The level of importance of IS/ICT in the HEI is assessed using organograms and interviews with IT and top management and as exemplified by the percentage of budget allocation and reporting lines (Appendix B, Sections B.1.5 & B.1.7). Levels of IT provision are established such as ratios of workstations to students (Appendix B, Section B.1.5).

Two questionnaires are used to assess the level of Knowledge Management: Firstly, a Knowledge Management Assessment Tool for Universities is adapted from an instrument devised by Kouwenhoven (1999). Secondly, in conjunction with this, the “KMat” (Maier and Mosely, 2003) questionnaire is used. “KMat” is an instrument which determines the effectiveness of an organisation’s KM practices. The items relevant to IS/ICT support are extracted from this and are shown in the appendix (Appendix B, Section B.2.12 - Q 4.2).

South African specifics are examined such as staffing, employment equity, and the impact of AIDS.

#### ***6.6.5.2.1 SIPM***

SIPM effectiveness is assessed by means of interviews. Formalism of SIPM is determined by comparison between stated and documented strategies, and effectiveness of SIPM by means of interviews. Flexibility of the strategic position is examined by means of interviews with IT Management and Top Management regarding planning cycles (Appendix B, Section B.1.7).

#### ***6.6.5.2.2 Support for tactical, management needs***

This section examines support for tactical and control management needs (Point 3 in Figure 6-3). The use of IS/ICT in enabling networked and speedy decision-making is assessed by means of interviews (Appendix B, Section B.1.8).

Comprehensiveness of systems for HEI specific needs at the managerial level is assessed by portfolio analysis. Portfolio assessment is done by providing a tick list of possible applications. This list is devised by the author after examining research and web sites internationally, and is used to assess what systems exist to support the needs of the HEI (Appendix B, Section B.2.3 - Q2.1).

Alignment with processes and features such as responsiveness and flexibility of systems is evaluated by a questionnaire estimating end user computing satisfaction (EUCS) as a basis for interviews. The questionnaire as described by McHaney, Hightower and White (McHaney, Hightower and White, 1999) is used to estimate user satisfaction with the enterprise system (Appendix B, Section B.2.4 - Q2.3).

#### ***6.6.5.2.3 Support for academic management and core value chain processes***

This section examines support for academic management (Point 4a in Figure 6-3) and support for the core operational value chain (Point 4b in Figure 6-3). Comprehensiveness of systems for HEI specific functions for academic and students' needs is assessed by portfolio analysis, as above, using a tick list of such systems (Appendix B, Section B.2.3 - Q2.1).

Information needs of academic staff and students are assessed by interviews (Section B.1.9 & B.1.15 in Appendix B).

Teaching and research needs and whether these are being supported by IT are questioned (Appendix B, Section B.1.9 - for the technical resources).

#### ***6.6.5.2.4 Support for support functions***

This section examines the support for support functions by IS/ICT (Point 5 in Figure 6-3). Comprehensiveness of systems for HEI specific support functions is assessed by portfolio analysis providing a tick list as above (Appendix B, Section B.2.3 - Q2.1).

#### ***6.6.5.2.5 Information behaviour***

To assess the information culture, interviews are held (Point II in Figure 6-3). The use of technology as a communication medium and electronic information and computer literacy and usage as a measure of information intelligence of the organisation is assessed by the questions proposed by the author (Appendix B, Section B.2.5 - Q3).

#### ***6.6.5.2.6 Quality of IT management***

This section examines the quality of IT management (Point A in Figure 6-3). Existence of, for example, steering committees and their effectiveness is examined through interviews (Appendix B, Section B.1.11). Documented policies are reviewed. Projects are tabulated and assessed for documentation.

#### ***6.6.5.2.7 Quality of IT service***

The quality of the service offered by the IT function to users is estimated by using an established questionnaire (Point B in Figure 6-3). ServQual is a measure of the perceived service offered by the IT division (Kang and Bradley, 2002; Jiang, Klein and Carr, 2002; Myerscough, 2002). It uses three measures – what is the ideal, what is possible given resources, and what is actually delivered. The difference in what is possible and what is actually delivered is a useful measure. This questionnaire if applied to IT staff and users also provides useful insight into different perceptions of these groups (Appendix B, Section B.2.2 - Q2.4).

#### ***6.6.5.2.8 Robustness of ICT Architecture***

Robustness (Point C in Figure 6-3) is assessed by interview (Appendix B, Section B.1.3).

#### ***6.6.5.2.9 Portfolio management***

This factor (Point D in Figure 6-3) overlaps with the questionnaire eliciting the completeness of the portfolio of systems (Appendix B, Section B.2.3 - Q2.1).

#### **6.6.5.2.10 *Quality of information***

This factor (Point E in Figure 6-3) is assessed by interview (Appendix B, Section B.1.5).

#### **6.6.5.2.11 *Extent of Alignment***

The analysis of alignment (Point II in Figure 6-3) is performed through interviews, as well as using an Alignment questionnaire (described in Appendix B). Luftman's maturity index of alignment is used in this research to estimate the alignment gap (Appendix B, Section B.2.1 - Q1.2. (As stated previously, the COBIT alignment model was felt to be limited to control). Luftman has published and been cited extensively on his alignment model. His "Alignment Maturity" questionnaire has been quoted widely as a measure of the gap between organisational strategy and IS/ICT strategy (Luftman, 2000; Luftman, 2003; Luftman and Brier, 2003; Luftman, Papp and Brier, 1999; Peppard and Ward, 1999; Ward and Peppard, 2002). This serves to examine IS/ICT support for strategic management in an organisation. The questionnaire gives an organisation an alignment index from 1 to 5 where 5 is fully aligned, based on six constructs.

### **6.6.5.3 *Exploratory areas***

The last section of the protocol attempts to discover ideas on areas where best practice and innovation have been shown, whether process reengineering has been embarked on, the existence of feedback loops, and the South African specifics of IS/ICT and the impact thereof. It also gathers together unplanned-for issues that have been discovered.

#### **6.6.5.3.1 *Leadership***

The leadership taken by the IT director in exploring and exploiting new technologies that could be strategic is examined through interviews with top management and IT directors.

#### **6.6.5.3.2 *Feedback loop***

Feedback systems to scan for emergent strategies, and monitor support for existing strategies are explored by interview.

#### ***6.6.5.3 Process reengineering***

Systems to speed up decision-making, or refine processes are sought by portfolio analysis and interviews.

#### **6.6.6 Database and coding**

An electronic file of all transcripts of interviews is kept as verified by respondents. Where existent, the actual voice recordings are also captured electronically. Coding is not used to group the content of interviews, as the format of the protocol grouped the information for the relevant constructs. Questionnaire results, summary statistics of the questionnaire and graphs resulting from these are also captured and stored electronically.

#### **6.6.7 Process - Data analysis**

The data from the case studies is analysed in Chapter seven, where the three case studies are compared and the findings measured against the proposed model, and the premises of Chapter one are discussed in Chapter eight. The scientific position of cause and effect is difficult in this context and therefore the lesser goal of antecedent factors is targeted. This is in the belief that such effects are more than “wildly unpredictable”.

#### **6.6.8 Writing the report**

The three case studies are described in appendices C, D and E, under the headings as imposed by the model.

### **6.7 Conclusion**

In summary, based on the literature, a model of antecedent factors for successful support of changing HEIs in SA is proposed in the previous chapter. A positivist case study method is chosen in order to conduct empirical research using this model as a framework.

This chapter explains the motivation for this choice, and then describes the form of the case study method, the protocol used to guide the conduct of the research, and questionnaires used in restricted form to provide triangulation, together with

documentary evidence in the form of documents printed or on the web. It details how the questionnaires and the protocol link up with the constructs in the model. The questionnaires are used for information (but not statistical purposes) and references are made to the Appendix where the full questionnaires are reproduced.

Appendices C, D and E describe the case studies in detail. Although these are not essential reading, they capture a rich description of each case and should be read in conjunction with the next chapter (Chapter seven). Chapter seven compares and contrasts the three institutions against the model, and Chapter eight concludes by corroborating the model on the evidence: the third and fourth stage of research as outlined in Table 6-1.

## **Chapter 7 Case Studies and Comparative Analysis**

### **7.1 Abstract**

In Chapter 5, a framework is presented for analysing HEIs in terms of transformation. Chapter 6 describes the research method by which case studies of three institutions will be conducted. This chapter introduces the three HEIs and compares and contrasts the results of the investigation. Areas requiring general attention are highlighted as well as areas where there are major differences.

### **7.2 Introduction**

This chapter briefly describes the three cases, Rhodes University, the University of Fort Hare and the University of the Free State (RU, UFH, and UFS) - the detailed cases can be found in Appendices C, D and E respectively, and may be read concurrently. The chapter then compares and contrasts the analysis of the three institutions according to the model and framework proposed in Chapters six and repeated in Figure 7-1, and the research method outlined in Chapter six. The Appendices C, D and E use the same framework for detailed analysis of each case. The difficulty of comparison and contrast given the nature of the research (case studies) is acknowledged.

The summaries of the questionnaire data are contrasted and areas that differ markedly are highlighted where comparisons are possible. Areas and issues that appear commonly problematic are reflected, as well as areas where good practice is exemplified.

It needs to be emphasised that this report is a status quo report, and that two of the Universities are in a process of change where the issues being raised in this report are being reviewed.

### **7.3 Background to the three cases**

As described in Section 6.6.3, the three institutions were chosen for specific similarities and differences:

Rhodes University is a small historically white institution which has undergone minor change through the shedding of a coastal campus during restructuring. The institution is described in detail in Appendix C (see Appendix Section C.5 for a background description). The University of Fort Hare is a small historically black University. It is of the same size as Rhodes University. It has a history marked by change and challenges. It has recently acquired the coastal city campus in East London, shed by Rhodes University, and has undergone dramatic change specifically in the last 10 years. It is described in detail in Appendix D (see Appendix Section D.5 for an overview). Both Rhodes and the University of Fort Hare are based in rural locations. The University of the Free State is a large city-based historically white institution. It has incorporated two campuses of other institutions and has undergone wide-scale change in recent years, similar to the University of Fort Hare, in order to remain functioning financially. While Rhodes University has been characterised by a mono-culture, the other two institutions could be termed multi-cultural, as the University of the Free State has contended with two language groups (Afrikaans and English) and the University of Fort Hare has prided itself on multi-culturalism. UFS is described in detail in Appendix E (see Appendix Section E.5 for an overview).

A pilot study at Rhodes University was conducted at the start of the research process in 2003 (as referred to in Section 4.3.2 and described fully in Appendix B and more briefly in Appendix Section C3) in order to explore the meaning of the term transformation and the issues of information access and usage at HEIs.

The case studies were conducted at RU, UFH and UFS over 2004 and 2005 and described in detail in the Appendices C, D and E. Interviews are the main source of information, while questionnaires and published material are also used.

Respondents to the interviews are top executive management (VCs and VPs); top administrative directors such as Registrars, Directors of Planning, Directors of Human Resources; IT management and managers responsible for software applications, as well as persons responsible for the web development; and academics at all levels from Deans to lecturers. These interviews follow the protocols detailed in Appendix B.



Questionnaires are directed at a selection of the above staff, and included middle-level administrative managers and students. The questionnaires used are established instruments for measuring alignment, service quality, ERP usage and Knowledge Management. Questionnaires to examine application portfolio completeness and organisational institutional behaviour were devised by the author and applied. Details of the persons interviewed and respondents are found in Section C.4, D.4 and E.4 for each institution.

Published documents and information from web pages for the institutions are also used.

The examination of the three institutions follows the framework of the model in Figure 7-1.

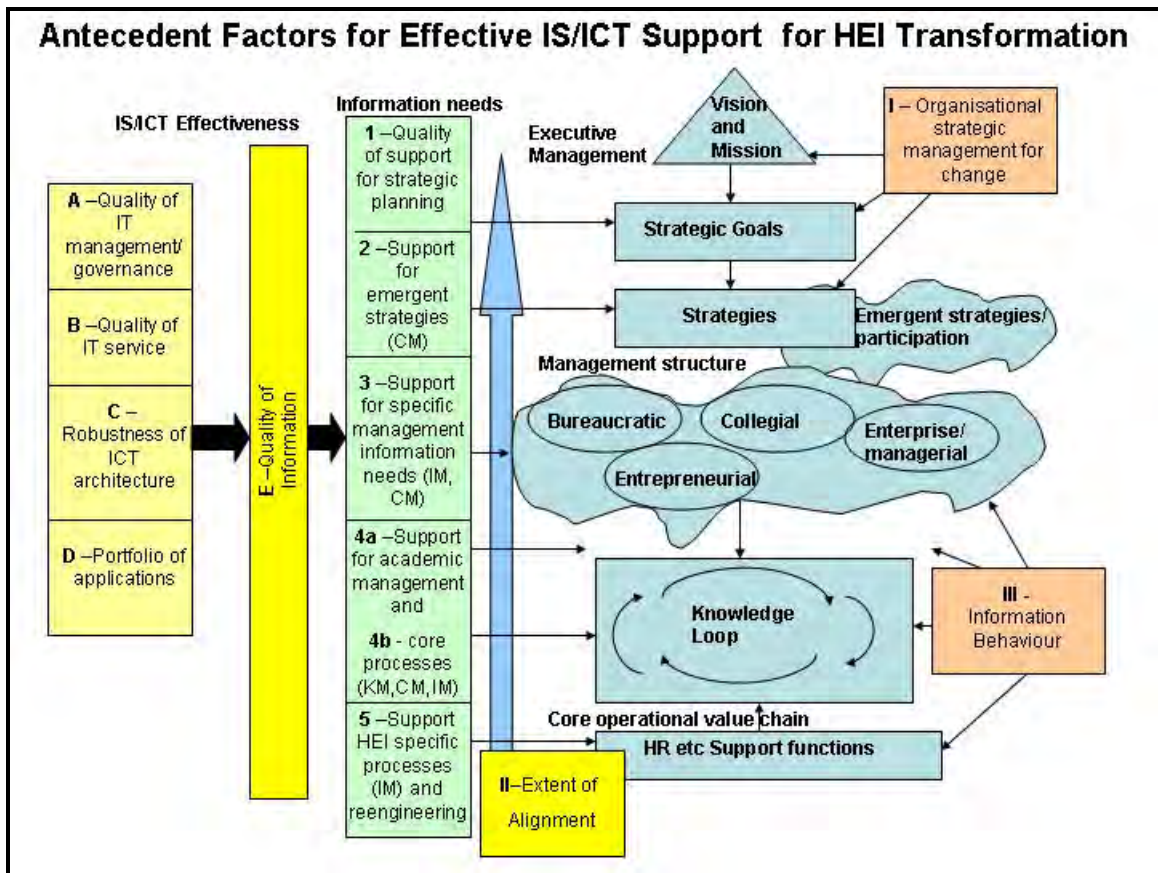


Figure 7-1 Analysis Model: IS/ICT, HEIs and Transformation reproduced from Chapter 6

This chapter reports on the findings from interviews, questionnaires and published reports (print and electronic) as applied to all three institutions by means of comparison and contrast (reported individually in the three Appendices C, D and E for RU, UFH and UFS respectively). Alignment is discussed under two categories – firstly, general alignment, and then secondly, at the end of the chapter, transformational alignment, with a specific focus on South African issues. Other issues that arise outside the framework are also discussed at the end of the chapter. There is overlap of the discussion of the antecedent factors.

## **7.4 Organisational context**

### **7.4.1 Environmental context**

HEIs in South Africa have become open systems, of necessity adapting to the environment of South Africa and globally. These changes are enforced by State as well as by moral imperatives. In South Africa, the need exists to balance academic excellence, in the traditional sense, with financial viability, and redress or community outreach (Fourie and Fourie, 2001). Universities have chosen positions with respect to these demands. The context in which the institutions operate, especially with regard to State intervention, have a greater impact on HEI decision-making than previously, especially as far as the HWUs are concerned. These changes or Government interventions are not necessarily all linked to optimal learning and research: An example would be the need for redress and thus a more open-access policy, but the resources to ensure support for less-traditional student intake are at present not forthcoming. Government capping of HEI growth at 3% for 2006 is another example, where the motivation has more to do with State financial resources than academic or national economic requirements.

The three institutions examined have similarities and differences, but operate in this same environment. For example, subsidies from Government have declined, and all three institutions are looking for ways of generating third stream income; all are attempting to

meet equity challenges in staff, and encountering the same obstacles; all are promoting quality of teaching by appointing technical support staff to assist academics; all are promoting research (relevant to SA) in a bid for more subsidies; and all are being forced to be open about their successes in meeting Government requirements of, for example, throughput.

The three chosen institutions are old (by South African standards), and based on traditional structures and modus operandi. RU and UFH are small, each with a rural-based main campus. UFS is a large University and is city-based.

Although small HEIs are said to be economically unsustainable, RU is on a sound economic basis and has a good academic reputation. It has good financial reserves and runs efficiently with thin administrative structures. It has had, compared to the other two institutions, a relatively stable history. UFH and UFS have experienced major change. As described in Section 8.3, UFH comes from an HBU background, which implies political upheavals of an extent not experienced by the other two institutions. UFH has a special history, and has a close relationship with Government. It has recently been awarded the Supreme Order of the Baobab (Gold Class) by the President for exceptional academic leadership in South Africa and Africa. It hosts the “Liberation archives” of the ANC. UFS has been a traditionally white Afrikaans-medium University, and has changed to a dual-medium institution, while opening its doors to all races (as has RU and all other HEIs in SA at different times during the last century). Both UFH and UFS have undergone financial changes for survival, and both have subsequently had the experience of incorporating alien campuses into their structures, while RU has divested itself of a city campus with much lesser impact.

#### **7.4.2 Structure**

All three institutions have the traditional structure and management committees of Council, Senate, Faculties, and Departments, and an executive management committee of senior academics and administrators, but UFS and UFH have added Executive Deans to the academic management level, and have Schools within Faculties with interdisciplinary

programmes. At UFH, this implies another level of academic management as Directors of the Schools are appointed. In the case of RU, faculty officers have been moved to the Registrar's division as part of the stream-lining process and to create a "one-stop" shop for students, but at UFH and UFS, they remain as part of the faculty.

### **7.4.3 Strategic management**

#### **7.4.3.1 Strategic management, vision and mission**

The three institutions have rational strategic management processes in place, which at RU and UFS are revised on an annual basis. This revision allows for emergent change to be factored in annually, and the budget allocated to reflect the strategic objectives. The institutions all have vision and mission statements. UFH's reflects its historic context and engagement with the community in aiding development, for instance, through meaningful and relevant research. UFS's vision notes the pursuit of academic excellence, while highlighting the ongoing change process; and RU's vision stresses its academic role while noting social responsibility and moral values. UFS has published its shared values.

The common theme is there across all three institutions – academic merit, relevance to the development of the country, and shared moral values, but within each institution there is a slightly different focus, as would be expected.

##### ***7.4.3.1.1 Strategic thrust especially with respect to transformation***

From interviews and surveys, the published mission and vision is supported by stated objectives:

- RU is focused on retaining and indeed strengthening its reputation as a quality university while striving to meet national transformation goals.
- UFS is deeply committed to transformation, but uses the term more widely than defined for national transformational goals. They are committed to community and regional involvement, and adapting the University to diversity and constant change –

cultural transformation. They have five focus areas for their strategic planning which are quality and excellence; equity, diversity and redress; financial sustainability; regional co-operation and engagement. In 2005, each of those areas was examined with respect to transformation in the cultural sense of the term, with strategic objectives outlined. UFS is also driving an eLearning initiative.

- UFH has as its main focus the building of external relationships and a role in the community. It has taken the issue of open access further than most other institutions. It is implementing financial strategies to increase third stream income.

Both UFH and UFS can be said to be transforming, in the meaning of changing rapidly and significantly. Both have strategies for financial changes, especially at UFH with respect to third stream income.

#### ***7.4.3.1.2 Strategic objectives/change drivers***

The strategic objectives of the institutions reflect the vision and mission, as well as the context in SA such as the requirements of Government. In the case of UFS, the objectives are grouped into five focus areas which have very clear strategies for implementation. The important drivers of change depend on the specific context of each institution. RU rated Government policy, research and third stream income as the most important contextual issues (in that order). This implies that RU sees the main need for change as meeting government requirements, improving its already good research profile, and increasing its funding base – an improvement rather than major change. For UFH, strategic issues are stated as mergers, massification/capping, employment equity and racial demography, research and third stream income. A rating survey was not carried out at UFS, but similar issues of concern as noted for RU and UFH are contained in the VC's address as reported on the website (UFS website).

#### ***7.4.3.1.3 Emergent change***

Annual planning revision takes place and reflects the ability of RU, UFH and UFS to cater theoretically for emergent change. How receptive they are to emergent ideas

depends on the level of decentralisation and democracy in each institution, the level of awareness of what is happening in the core operations, and the speed of decision-making.

#### ***7.4.3.1.4 Success of strategies***

The success in achieving the institutions' strategic objectives is evaluated by means of interviews. Areas of success are highlighted by participants.

At RU, a success rating is estimated by means of a questionnaire, and the strategies that rate highly are meeting Government Policy requirements, search for extra funding (through the centennial funding drive particularly), campus safety, and throughput rate.

UFH's success is reported to be in the area of putting a strategic management team in place, creating a foundation for generating external funding, and providing open access for students (although there are doubts whether the necessary support for these students have been put in place at the same time). The incorporation process, although more difficult than envisaged, is stabilising.

UFS rates its financial turnaround with the concomitant increase in student numbers and increase in third stream income as a success; so also the change in student demography and dealing with multiculturalism (although there are still problems faced in this respect). Its research output is increasing, and its eLearning initiative is reportedly bearing fruit, although there are doubts raised about the latter initiative.

#### ***7.4.3.1.5 Culture***

Of the three institutions, RU has possibly retained the most homogeneous culture, largely unchanged through the last decades. There is a seeming unity of values and pride in the University, coupled with a conservative (perhaps complacent?) attitude.

UFS and UFH are undergoing large cultural changes. UFS was a white Afrikaner University (put simplistically) that has now changed to a dual medium institution with a large representation of Sotho-speaking students, and increased diversity with the incorporation of two campuses. UFS has a feeling of vibrancy and energy.

UFH has a history of being multicultural, although there was a stage when the student body was predominantly Xhosa, with the loss of students from the rest of Africa except for an echelon of Zimbabwean students, during the “bush college” days. It has now incorporated a campus that has had a good representation of white students. At present, there is a difference between the city campus and the main campus regarding students: the main campus has a large proportion of students who are rural and from poor (educational and economic) backgrounds who are largely young undergraduates recently from school, versus the city campus that has more “middle class” students (from former public Model C schools that served white pupils and had very good reputations, and which are now multiracial), as well as professional and mature students. The staff profile is varied, with what appears to be a larger proportion of staff from the African continent than at the other two Universities. UFH takes great pride in its tradition and is a microcosm of the striving of South Africa towards a truly South African multi-racial society.

#### **7.4.3.2 Management and decision-making style**

##### ***7.4.3.2.1 Management style***

The balance between management styles, the stability of the environment, and the management styles that pertain to these is depicted in Dobson and McNay’s grid (1996). Although this grid is a useful categorisation of a dominant management and cultural mode for HEIs, organisations normally operate in different modes, and HEIs are similar in this respect. The position of the three institutions superimposed on this grid is proposed in Figure 7-2.

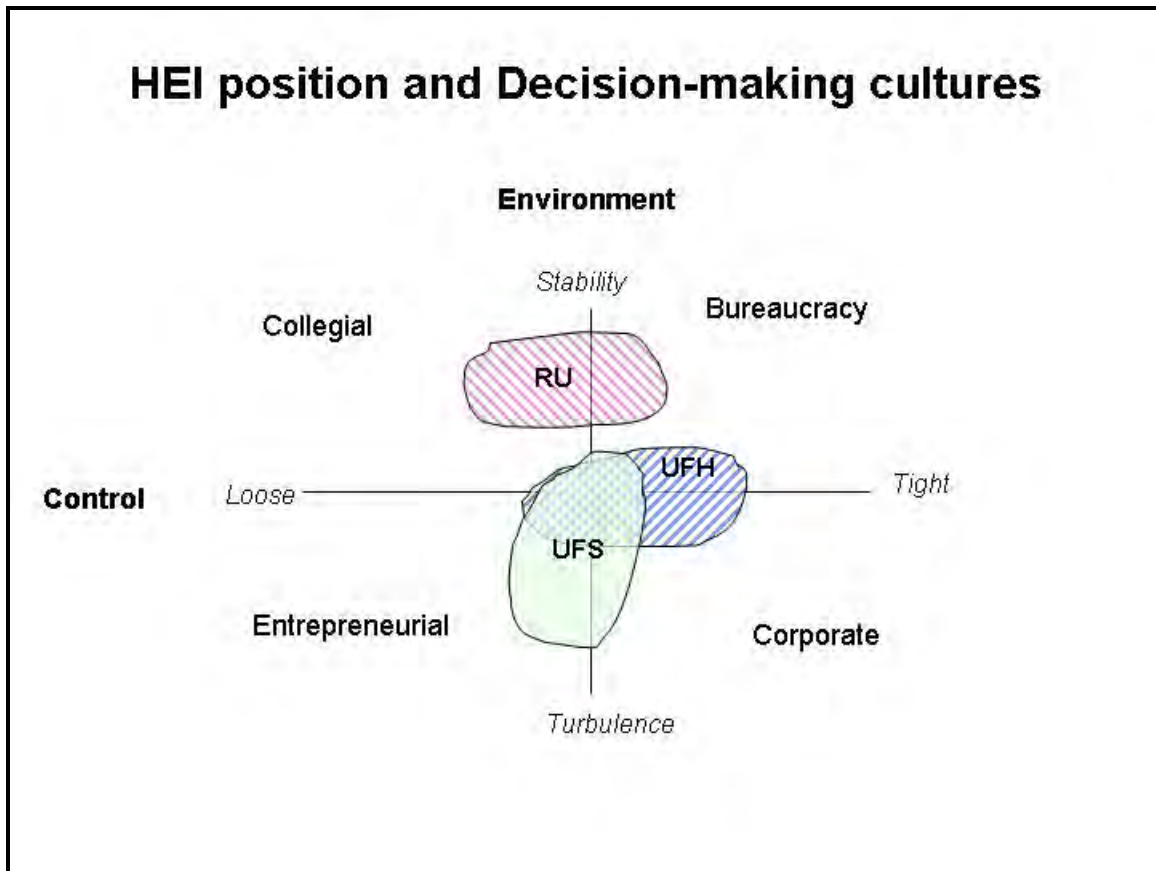


Figure 7-2 Management Styles from Dobson and McNay – 1996

RU has a collegial style that operates under a committee structure within a relatively stable context.

Both UFS and UFH have been, and are, operating in a turbulent environment within and without. They both state that they have an entrepreneurial focus, whilst retaining the traditional bureaucratic decision-making structures. UFS has decentralised management in place and thus has a “looser” control profile. UFH is on the whole very tightly controlled by the Vice-Chancellor and is highly bureaucratic, which counters the “entrepreneurial” claim. Both have an overarching corporate management style epitomised by the use of titles such as CFO and COOs.



#### 7.4.3.2 Management structure

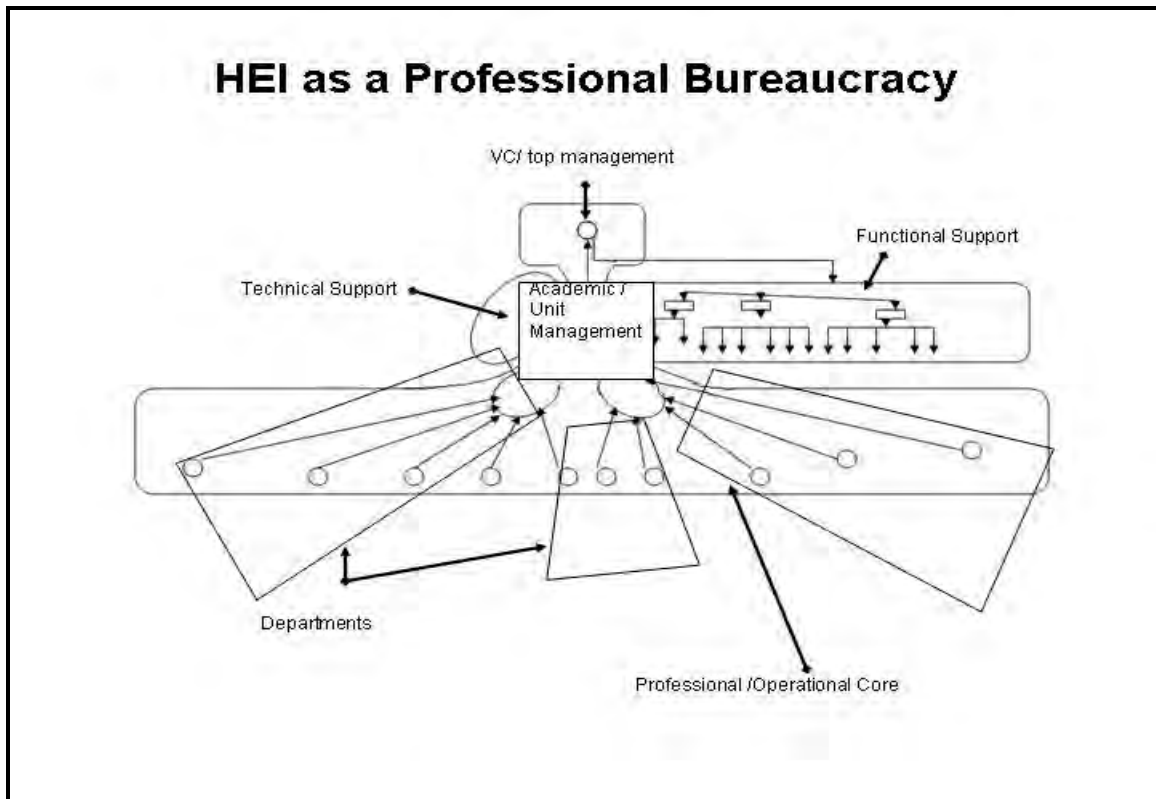


Figure 7-3 Mintzberg's professional bureaucracy adapted to HEIs

Universities have increased the number of technical support staff for quality assurance, teaching and learning and planning (using the vocabulary from Mintzberg's depiction of a professional organisation – Figure 7-3). This phenomenon is not limited to South Africa. The negative effect of this increase in non-academic staff is the diversion of funding from the core operations (Sporn, 1999a). Technical support has increased in all three institutions: Planning Units or Managers responsible for planning exist; Quality Assurance and Teaching and Learning support staff have been appointed; and support for research has increased.

The ratio of administrators to academic staff is a troublesome issue globally as well as at these institutions issue. As Johnson (2006: 67) quotes: “You know when you park your car in the garage you park next to a nice car and you will know that that is a senior management and this is a senior academic”.

An enlarged (bloated perhaps) bureaucracy diverts funding from core operations. RU has a small functional support team, and is “thin” on top management. UFH’s functional structures and top management take up a proportionately large part of the budget (an inheritance from the apartheid era where staff were appointed for political and humanitarian reasons, according to one respondent). This contributes again to diminished funding for core operations. It was not discovered what the position is at UFS.

The three institutions have retained the departmental structure, although there was a move at UFH to dismantle these into programme units, based on multidisciplinary teams. Thus at UFH there is a slight blurring of departmental divides and much talk of “trans-disciplinarity” – a term recently introduced which is more over-arching than multi-disciplinarity.

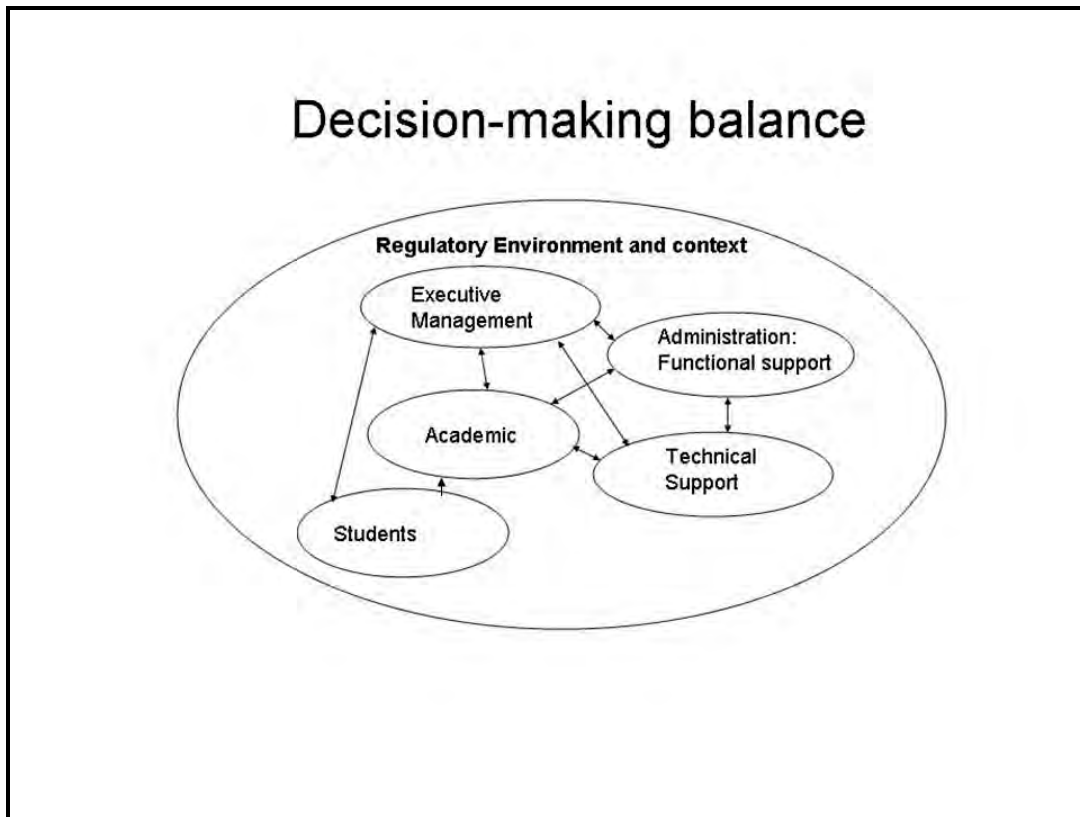
Academics no longer have the dominant role that used to hold in the traditional collegial universities. However, coupled with this, more administrative duties have been placed on academic leaders, especially where executive Deans are concerned, who also have teaching duties, as is the case at UFS and UFH. Executive Deans and School Directors are generally paid large salaries, and this raises a question as to how effective or efficient this arrangement is. If the Deans generate funding, as is part of their brief, both to justify their positions financially as well as relieving academic staff of academic management problems, then there is no argument, but it is not clear whether this analysis has been done.

Not depicted in the diagram is the fact that academics bear the brunt when operational processes are faulty, as they are usually the first port of call for students. UFH has found that in the incorporation process, while systems and processes were being adapted,

an extra load was placed on academics which had also not been allowed for in the incorporation and divestiture processes (SAc, 2005).

#### **7.4.3.2.3 Decision-making balance – centralisation/decentralisation**

The three institutions have to find the balance with respect to decision-making between the various sectors as shown in Figure 7-4.



**Figure 7-4 Balancing sectors**

The tensions between administration and academics, and administration and students have always been in existence. All three institutions report existence of these tensions.

The expansion of the technical support sector has provided more complexity, and they are often caught between the need to be a support service for academics and the institution, while having to follow Government requirements. This dichotomy is exemplified in the

short course policy of universities – there may be the need for short courses that could provide income for the university, but these may not be offered (despite being non-subsidy bearing) if they are not at the required tertiary level. The technical support staff have the responsibility to ensure that the universities comply with Government regulations. Tensions also exist between academics and these support units. A counter example is that of UFS, staff were appointed in the faculty to drive, for example, teaching and (e)learning initiatives as well as community projects and research. As they were appointed by the Dean, this gave “ownership” to the academics and their needs.

In the 1960s, students played a large role in decision-making globally. In South Africa in the 1980s, especially in HBUs, they also played an enormous role in “the struggle”, but their voice is seldom heard at present. In the case of UFH, for example, their influence has been described as minimal (SAc, 2004). All three Universities have Student Representative Councils (SRCs) who meet with the executive management on a regular basis.

#### **7.4.3.3 Process effectiveness**

The registration/student administration process at a university can be used as a litmus test of the university’s processes and customer-centricity.

Respondents rate RU’s student administration processes as effective and indeed competitive. Both UFH and UFS acknowledge that more effectiveness is required in their administration. UFS stated that more needs to be done to improve their processes. UFH’s processes are under criticism (especially from the city campus’s students) and complaints were received about the 2005 process as evidenced from a student survey done as part of a research task: Manual and automated processes did not blend well and errors were made that later caused major frustration to students. However, the process of reengineering is underway and the 2006 registration is vastly improved. UFS’s process at the start of 2005 was smooth, but not automated. RU’s registration was efficiently supported by IS/ICT – any hold-ups experienced were related to physical processes and logistics rather than technology-related (SAc, 2005), and resulted in few complaints.

None of the institutions, however, have a totally web-driven approach and physical presence is required.

## 7.5 IS/ICT Strategic management

### 7.5.1 IS/ICT importance

McFarlan and McKenney's grid can be used to assess the status (or desired status) of information systems with respect to their strategic alignment/importance. The grid has been slightly adapted for HEIs in Figure 7-5 and the position of the three institutions regarding the importance of IS/ICT is proposed on it.

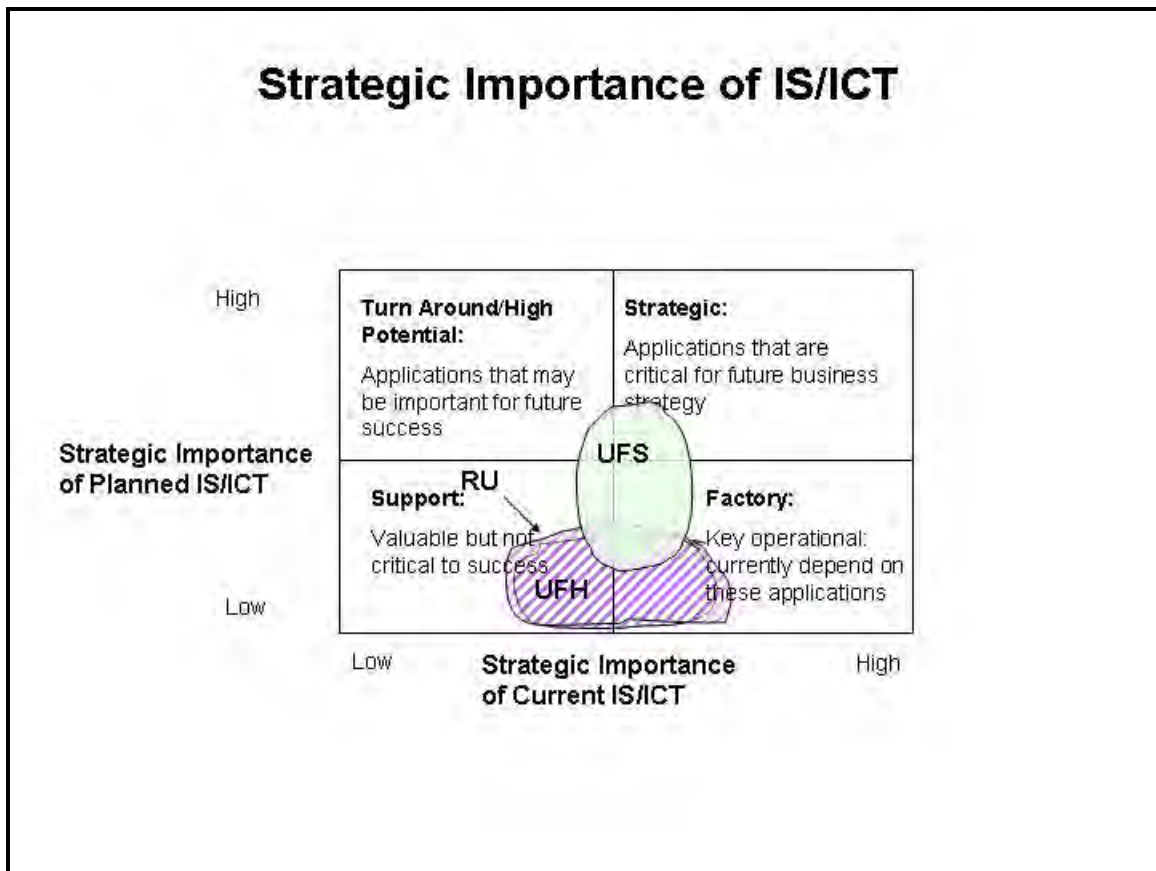


Figure 7-5 McFarlan and McKenney's Grid applied to the selected HEIs

The importance of IS systems would appear to be in the lower quadrants – either Support or Factory as indicated in the diagram. None of the three institutions mentioned applications that would fit into the top two quadrants, although UFS mentioned the installation of their ERP system as strategic.

Staff at RU and UFS stated that the administrative systems would not be missed if they were down for a while: “we would just carry on teaching” (SAC, 2004) – the Support view. This view is echoed by administrative staff especially at UFS, who are frustrated with the difficulties of obtaining adequate MIS information from the new system. All, however, agree that email is vital. Loss of email and problems with email are mentioned as seriously disruptive, especially to academics (SAC: RU, UFH, 2004), and this would point to email being in the Factory quadrant.

UFS states that the change to an ERP was strategic, and the University is putting a great deal of emphasis on eLearning, and thus UFS has been depicted as having a higher strategic IS/ICT importance than the other two institutions.

### **7.5.2 Background**

RU has a well-established reputation for IS/ICT leadership epitomised by the introduction of email to SA Universities. They have been chosen to host the SEALS project (the South Eastern Cape Academic Libraries project), and they have acknowledged expertise in bandwidth management. UFH, and to the author’s knowledge UFS, have not enjoyed such a visible reputation.

### **7.5.3 ICT provision and ratios**

The ICT provision is good across all three institutions, and at RU and UFS access for students is good with wired residences and functioning open laboratories. UFH comes from a very low base, has a “state of the art” backbone that has been newly installed, but needs to expand provision of computer technology.

Teaching equipment provision is patchier at all institutions. At RU some venues have good provision of computers and data projectors, while other venues are reportedly

antiquated (although there is a roll-out plan for upgrading all venues). At UFH, especially the main campus, there is little or no provision of computers and data projectors. UFS reportedly has outdated venues, and both UFS and UFH have had losses of equipment due to theft.

It was not possible to get ratios from UFS and UFH of workstations to students, but the RU 17:1 ratio is good compared to responding Universities' average in the pilot survey of 70:1 (Appendix A). A perennial problem at all is the replacement cycle for computer technology. At RU there is a fairly successful roll-down policy where usable desk-top computers are rolled down to users who do not need high functionality, and new computers given to "power-users".

#### **7.5.4 SIPM**

Strategic management (SIPM) is at the beginning stages for the IS/ICT related units in these institutions. All are in the process of establishing strategic management, although this occurs informally at RU, and UFH has produced a planning document. At both these institutions, the planning deals mainly with ICT issues and cannot be described as strategic planning. The UFH plans were published in 2003, but no measures of implementation success exist.

#### **7.5.5 KM and CM**

None of the institutions practice strategic Knowledge or Communication Management with respect to IS/ICT, although UFS's focus on eLearning is a move in that direction.

The technology exists to practice KM and CM, but IS/ICT is barely used in this respect. KM and CM and IS/ICT support for KM and CM is discussed under alignment issues pertaining to transformation (see Section 7.17.2 and 7.17.3).

### **7.6 *Extent of Alignment***

The nature of alignment of IS/ICT with organisational strategies is not formal.

Alignment maturity is assessed (using Luftman’s Questionnaire) and the comparative results can be found in Table 7-1:

<b>Alignment Maturity Index</b>								
<b>HEI</b>	<b>RU</b>		<b>UFH</b>		<b>UFS</b>			
<b>Constructs</b>	<b>Mgm</b>	<b>IT</b>	<b>Mgm</b>	<b>IT</b>	<b>SAd</b>	<b>SAd</b>	<b>SAd &amp; SAc averaged</b>	<b>IT</b>
Communications	3.4	2.9	1.4	2.5	1.6	2.5	2.1	2.8
Competence/ Value metrics	2.9	2.5	1.0	2.1	1.9	1.6	1.8	1.3
Governance	2.9	3.8	1.3	2.1	2.3	2.9	2.6	2.3
Partnership	3.6	2.3	2.0	2.0	1.8	3.0	2.4	2.8
Scope and Architecture	3.2	2.5	1.3	2.8	1.4	2.0	1.7	3.0
Skills	2.9	2.4	1.5	1.9	1.8	2.5	2.2	2.0
Average	3.1	2.7	1.4	2.2	1.8	2.4	2.1	2.4
<b>Overall Index</b>	<b>3.0</b>		<b>1.8</b>		<b>2.2</b>			
<b>Average for HEIs</b>	<b>2.3</b>							

**Table 7-1 Alignment index comparison**

For UFH and UFS, the IT estimate of the alignment index is higher than the estimate by other staff members. RU is the opposite, which the author posits is the result of the IT Director having high goals and expectations for his unit and being dissatisfied with the status quo. Only for UFS is a differentiation made between Academics and Administration perceptions, and the difference is marked, with academics viewing alignment as less satisfactory. Administrative staff and IT’s estimates are similar.

The scale for this survey is 1 to 5 corresponding to levels of maturity, where 5 indicates full maturity. The levels of alignment maturity are low, especially for UFS and UFH – level 1 and level 2, while RU is rated at level 3. This could well be a reflection of the



relative stability of IT Management at RU, while at UFS a new director has been in the position for a short space of time, and at UFH, the IT Director was acting for a long time and only confirmed as Director in the beginning of 2005.

Given the low levels of formal strategic management for the IS/ICT function, the estimated levels are not surprising, a view supported by, for example, Cohen (2002) and other writers.

## **7.7 *Implementation and monitoring***

Of the three institutions, only UFH is in the process of installing a Balanced Score Card system for monitoring the effectiveness of the IT Division, amongst others. RU and UFS do not have any such management system in place at the time of writing.

## **7.8 *Support for tactical, management needs***

### **7.8.1 IT support for management decision-making**

All three institutions exhibit mixed decision-making and management styles. The use of IS/ICT specifically in support of effectiveness and efficiency of decision-making is limited at RU and UFH. All three institutions use email to distribute documents related to committee meetings. However, UFS has gone much further in the use of IS/ICT to improve efficiency and effectiveness, with their use of translation technology, paperless meetings at executive management level, virtually “instant minutes”, and archiving of past minutes that can be searched. At RU, special mention is made of the need for targeted information to allow for informed decision-making on the various committees, and which is apparently not forthcoming.

### **7.8.2 Support for academic management**

A great deal of dissatisfaction is expressed in the area of academic management and decision-making support, especially by the more computer-literate academic staff. Academic Deans are required to make managerial decisions, but have difficulty in

obtaining the type of information needed. Very few, even of the computer-literate Deans, have direct access to the system and most work through intermediaries.

All three institutions experience problems with management information. This is symptomatic of the scattered nature of handling of technology and information (as shown in the organograms).

At UFS, the lack of adequate management information is particularly vexatious. The Planning Unit acts as intermediary to source this data, and is proactive, but the system is still new and therefore every request is a new request, whereas previously there were semi-standard ways of obtaining this information. The Planning Unit also has to work with the IS Unit to obtain information, so it is a three step process. The unit has requests coming from support units who should ideally be managing their own data requests. Although management information seems to be satisfactory particularly for the management of support functions, this is not the case for academic decision-making: frustrations are expressed widely by academics at the lack of quality academic information. Academic leaders struggle to have wireless facilities installed despite having the budget for this at UFS. In the author's opinion, this could epitomise the lack of responsiveness to academic needs for information also.

These complaints are echoed at RU and UFH. At RU, one of the Deans has written his own system to access the database for student and other information. For other Deans, the Data Manager at RU who is in charge of the enterprise applications and software development is seen as particularly responsive to their information needs. However, in common with the other two institutions, departmental academic records are run as parallel systems and have the attendant problems of non-alignment of the data and the issue of double work. At UFS, student mark information is uploaded or downloaded centrally using spreadsheets with specific format, while at UFH, manual mark entry is required (although this is changing). This transcription causes errors. RU uploads electronic mark information supplied in specific formats from departments.

Budget information is about to be visible directly from the system for academic departments and faculties at UFH, and at RU to-date budget information is available on-line from HoD level. This is not possible yet at UFS.

From the discussion, it would appear that the needs of administration are better met than that of academic management.

## 7.9 Support for core operations: Teaching and research

The diagram for the core operations based on the work of Stabell and Fjelstad (1998) for professional organisations is adapted in Figure 7-6 (repeated from Figure 5-9) to fit an educational institution:

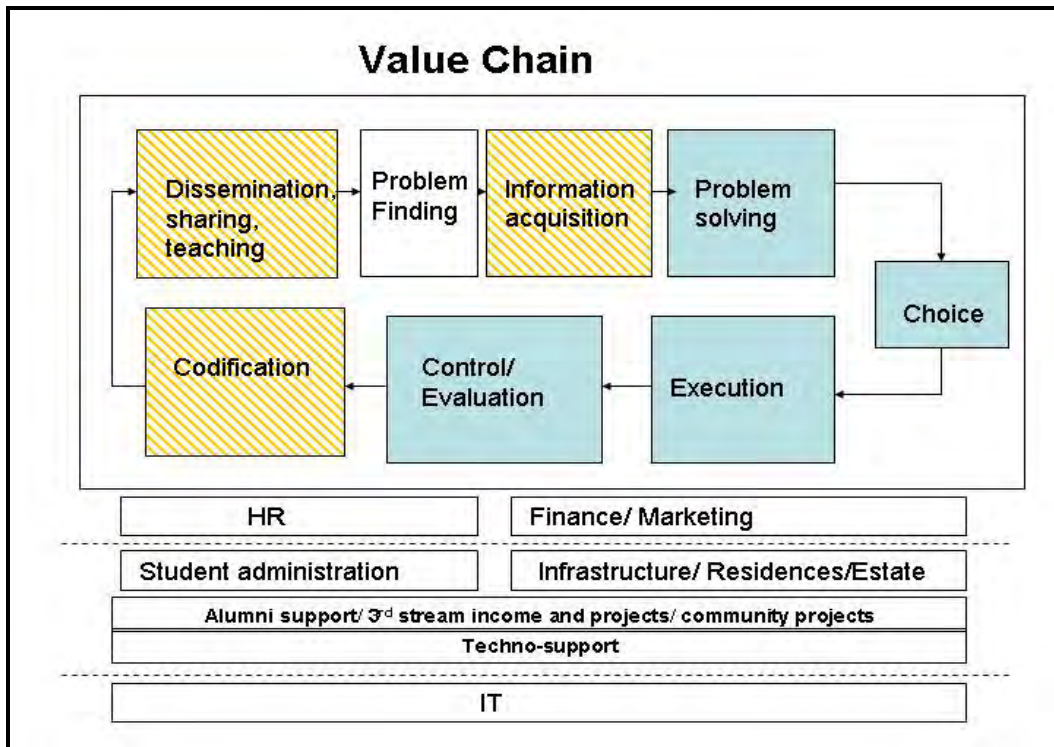


Figure 7-6 Core value chain operations adapted from Stabell and Fjelstad (1998)

The diagram is shaded to indicate where IS/ICT can possibly be used profitably, with the hatched area showing most obvious impact. There are discussed in the section following.

### **7.9.1 Dissemination, sharing, teaching**

All three institutions are examining ways of using IT to “improve” learning, generally focusing on mixed-mode learning. UFS is making huge strides in this area through its e-learning focus. UFH is using WebCT® at a minimal level.

As mentioned in Section 8.5.3, teaching equipment appears to be problematic at all institutions, but especially in terms of maintenance and management. Support for lecturers in the use of the equipment can be improved. The urgency required to get equipment up and running before a lecture is not recognised sufficiently. While the institutions may differ in the percentage of lecture rooms that are fully equipped, management of this equipment is not satisfactory in that it seems to fall into “no-man’s-land”.

Support for research activities is certainly possible, but it would appear as if IS/ICT is not fully exploited. UFS has a specialised research system which would allow more efficient dissemination of institutional research activities, but this is not operational yet. Both RU and UFS have research pages on their Internet site with research reports (reports on research done) in PDF format. UFS’s is somewhat old (2002), but are searchable to some extent. UFH does not have a visible web presence for research. In the author’s opinion, more support could and should be generated by IS/ICT for research.

IS/ICT is not evident in interaction with the community and in community projects, although websites at RU and UFS do provide static information.

Whether the eLearning initiatives will address the needs of the diversity of students enrolled both at both UFS and UFH, is an unanswered question. The diversity comes from different cultures, different languages, different educational backgrounds, and different values. Ideally this is where technology could be usefully harnessed.

### **7.9.2 Codification**

The facilities exist to capture and store course material electronically for sharing and this is happening to some degree at UFS, but less so at the other institutions, although isolated

departments are proactive in this respect (storing material such as practicals and course notes on the web).

Software products exist such as word processing and spreadsheet facilities and statistical packages to support research.

### **7.9.3 Control/evaluation**

UFH is using a technology-supported lecturer evaluation to a minor extent on the city campus and attempting to introduce it across the campuses. To the author's knowledge, this is not happening at either UFS or RU. Examiners' reports are not at present electronically available at UFH.

### **7.9.4 Information acquisition**

The web is, of course, used by all academics, researchers, and students (to the extent that they are no longer apparently able to read paper journals) for information acquisition at all three institutions. Research is extremely well supported by library systems. The SEALS project has been very successful for RU and UFH.

## **7.10 Support for support functions**

As noted earlier, (Section 8.8.1 and 8.8.2), the support functions are in general satisfied with the support they are obtaining. The RU and UFS senior administrators questioned are happy with the systems, although at RU it is specifically noted that information is obtained through intermediaries by top management. This may not be an ideal arrangement, but until systems can be used to provide the exact information executives need, this is likely to continue. At UFS, this satisfaction is even more apparent, where with the introduction of a new system, close cooperation exist(ed) between administration and the IT division.

## **7.11 Quality of IT management**

### **7.11.1 Structure and management**

#### **7.11.1.1 Structure**

The proposed “ideal” reporting structure of a CIO or IT Director reporting directly to the VC does not exist at any of the three institutions. (This is touched upon in Section 8.3.4).

In all three institutions, a distinction is made between information and information systems (IS), communications and knowledge (CM and KM) and technical (ICT) management and this is evinced in the organograms (Appendix Sections C12.1.1, D11.1.1, and E12.1.1). At all three institutions, IT Directors are responsible for ICT management. All have Communication Management vested elsewhere (Strategic Communications, and Marketing and Communications), with IT providing a service to these units. The webmasters are at lower levels and report to the Director of Communications, as well as having dotted line reporting to the IT Director. KM is not seen as part of anyone’s portfolio. At RU, IS is managed by the Data Manager; at UFS by a Systems Director, while at UFH the responsibility is not defined (although it appears in the IT Director’s quoted strategic plan); with a consultant “looking after” the ERP system.

The IT Directors report to the Director of Operations (or equivalent) at UFH and UFS, while reporting to the VP at RU. At RU, the Data Manager reports to the Director of Finances (RU Website), but the Registrar is the person who controls access to the ERP system.

Thus the reporting and management of IS/ICT is fragmented. If the reporting structure is used as an indicator of IS/ICT importance, the position of the low strategic value of IS/ICT outlined in Section 8.5.1 is corroborated.

### **7.11.1.2 Staffing**

RU and UFH have vacancies and need more skilled staff. This tallies with the problems expressed by HEIs in South Africa that they have difficulty in attracting skilled staff. UFH in particular reiterates the difficulty of attracting and retaining skilled IT staff (although they have strangely not advertised for applicants in 2005/6), and RU, while their retention rate is good, also have difficulty in attracting staff. The IT management at UFS, by contrast, is satisfied with staffing and mentions the almost 0% staff turnover, although opinions are voiced by other staff that service delivery would be improved if there were better capacity. Both UFS and UFH have resorted to consultancy or outsourcing in the installation of their ERP, but this has ended at UFS, whereas UFH are retaining an ERP consultant. The latter arrangement has been shown to be an expensive option by Swartz and Orgill (2001).

### **7.11.1.3 Budget**

All respondents state that IS/ICT is vitally important, but if budget is used as a factor for determining importance, this is not reflected in the budgets of the three institutions.

Once-off infrastructural hardware and software have been invested in, and in the case of both UFS and UFH, the ERP systems are substantial investments. UFH's technical infrastructure is similarly a large outlay (which was fortunately carried by merger funding), but the annual budgets are low. RU's software investment is much lower than those of the other two, because of the use of home-grown systems.

## **7.11.2 Management and governance**

### **7.11.2.1 Service level agreements**

None of the three institutions has service level agreements for services rendered internally. RU, however, as host of the Library SEALS project, has an SLA in place for this project. There is talk of SLAs at UFH as part of the Balanced Score Card (BSC) initiative which is in the process of being installed, but it is still to be implemented. At

RU and UFS, the lack of SLA's may be due to the absence of formal implementation and monitoring mechanisms (the maligned managerialist methods!)

### **7.11.2.2 Committees and meetings**

RU has a steering committee (as well as subcommittees thereof) that oversees especially purchasing of IS/ICT. It also has a "Teaching and Learning Technology Round Table" (TLTR) committee to advise on eLearning. UFS has an Advisory Board and Faculty IT Committees. UFH does not at present have any committees to support the IT Director. The existence of, particularly, a steering committee has been mentioned by researchers as an important pointer to good governance and alignment.

### **7.11.2.3 Policies**

#### ***7.11.2.3.1 General***

Another important pointer to good governance and alignment is the existence (and implementation) of policies and procedures. RU has some published policies in place, UFH has recently published some policies, and UFS is in the process of formalising policies (Table 7-2). This fact surfaced through the application of the alignment maturity questionnaire as well as interviews and documentary evidence at all three institutions.



<b>Policies</b>		
<b>RU</b>	<b>UFH</b>	<b>UFS</b>
Acceptable usage policy	Acceptable usage policy	Acceptable usage policy
Network monitoring and privacy	Information security policy	
Plagiarism	e-Communication policy	
Staff dialup/email registration	(email disclaimer)*	
Telephone	(Website terms and conditions)*	Web policy*
Purchase of personal computers	Internet usage policy	
Wireless network	(An IP Manual is being drafted)*	
* = unpublished		

**Table 7-2 Policies**

RU publishes usage statistics on the Internet, and has a very transparent management style. It would appear that in terms of “governance”, this is an area that needs attention at the other two institutions. There is no information policy framework visible at any of the institutions, such as suggested by Bernbom in Katz and Rudy (1999), for the creation (sharing implications), storage (standards), maintenance (responsibility for keeping accurate and up-to-date), use and access (privacy issues and accountability issues), and preservation or disposal (legal requirements) of information.

#### **7.11.2.3.2 Charge-out policy**

None of the three institutions operates on a charge-out basis to Departments or Service Units, although this has been mentioned as a future possibility by UFH. This is related to the lack of service level agreements (Section 7.11.2.1).

#### **7.11.2.4 Security and disaster recovery**

Security and disaster management were not probed fully at the three institutions.

Security is an ongoing issue of concern, and is mentioned as such by UFS, and by RU as an ongoing, but successful, process. RU has good backup procedures in place. UFH's backup procedures were reportedly non-existent at the time of writing in 2005.

### **7.12 *Quality of IT service***

#### **7.12.1 Service quality**

As a support unit, there are bound to be dissatisfied users: 100% service is impossible. However, at RU and UFS, admiration is expressed for the IT function as well as the IS function. No opinions are voiced at UFH, except for negative comments about lack of responses to faults reported, and the lack of communication with users if services are not available or disruptions are imminent.

Service quality is assessed using the Servqual survey conducted for triangulation and comparative purposes. The comparative results of "Actual Service" rendered can be found in Table 7-3. The rating scale is 1 to 7 where 7 represents "The Best".

<b>Q2.4 Servqual: ACTUAL Services rendered</b>															
	<b>RU</b>					<b>UFH</b>					<b>UFS</b>				
<b>Services</b>	<b>IT</b>	<b>Stud</b>	<b>Ad</b>	<b>Ac</b>	<b>User</b>	<b>IT</b>	<b>Ac</b>	<b>Ad</b>	<b>Stud</b>	<b>User</b>	<b>IT</b>	<b>Ac</b>	<b>Ad</b>	<b>Stud</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>															
When promising to do something by a certain time, will do so	5.0	3.5	4.4	5.0	4.3	4.0	3.5	3.0	2.2	2.9	6.0	3.0	5.5	4.7	4.4
Perform the service right the first time	5.0	4.5	4.8	4.8	4.7	4.0	4.0	3.0	2.0	3.0	6.0	3.8	6.5	4.7	5.0
Inform users when request can be completed	6.0	4.0	4.4	5.0	4.5	5.0	3.5	3.5	3.8	3.6	7.0	2.8	7.0	3.7	4.5
Inform users regularly about the status of users' requests	6.0	3.0	3.8	4.0	3.6	5.0	2.5	2.0	2.0	2.2	7.0	2.0	7.0	3.3	4.1
Provide services at the time they promise to do so	4.5	3.0	4.4	4.8	4.1	4.0	1.0	2.5	2.8	2.1	6.0	3.5	7.0	4.3	4.9
Average	5.3	3.6	4.4	4.7	4.2	4.4	2.9	2.8	2.6	2.8	6.4	3.0	6.6	4.1	4.6

	RU					UFH					UFS				
Services (ctd.)	IT	Stud	Ad	Ac	User	IT	Ac	Ad	Stud	User	IT	Ac	Ad	Stud	User
<b>Responsiveness: Excellent information services will</b>															
Have operation hours convenient to all their users	4.0	5.5	4.8	5.0	5.1	5.0	2.5	5.0	3.4	3.6	7.0	4.3	6.5	5.9	5.5
Give prompt service to users	4.0	4.5	4.4	4.5	4.5	4.0	2.0	4.0	2.4	2.8	7.0	3.5	6.0	4.3	4.6
Always be willing to help users.	4.5	3.5	4.2	4.0	3.9	4.0	2.0	3.5	2.8	2.8	7.0	4.5	7.0	4.5	5.3
Never be too busy to respond the users' requests	3.5	2.0	3.8	4.3	3.4	3.0		4.0	2.8	3.4	7.0	3.8	6.0	4.6	4.8
Average	4.0	3.9	4.3	4.4	4.2	4.0	2.2	4.1	2.9	3.0	7.0	4.0	6.4	4.8	5.1
<b>Assurance: Employees in excellent information services will</b>															
Instil confidence in users by their behaviour	6.0	4.5	4.6	5.0	4.7	4.0	1.5	4.0	2.0	2.5	7.0	3.8	7.0	4.3	5.0
Be consistently courteous with users	5.0	3.5	5.6	5.0	4.7	4.0	2.5	4.0	1.4	2.6	6.0	3.5	7.0	5.0	5.2
Have the knowledge to answer users' questions	5.5	4.0	5.2	5.0	4.7	4.0	2.0	3.5	2.6	2.7	7.0	3.3	7.0	5.9	5.4
Average	5.5	4.0	5.1	5.0	4.7	4.0	2.0	3.8	2.0	2.6	6.7	3.5	7.0	5.0	5.2

	RU					UFH					UFS				
Services (ctd)	IT	Stud	Ad	Ac	User	IT	Ac	Ad	Stud	User	IT	Ac	Ad	Stud	User
<b>Empathy: Excellent information systems employees will</b>															
Give users individual attention	5.0	5.0	4.8	4.8	4.9	4.0	2.0	4.5	1.8	2.8	7.0	3.8	7.0	4.6	5.1
Have employees who give you personal attention	5.0	4.5	4.8	4.3	4.5	4.0	2.5	5.0	2.2	3.2	7.0	4.3	7.0	4.4	5.2
Have the users' best interests at heart	6.0	4.5	5.6	4.5	4.9	3.0	3.0	4.5	2.0	3.2	7.0	3.0	7.0	4.3	4.8
Understand the specific needs of their users.	5.0	3.5	4.8	4.3	4.2	4.0	2.5	4.5	2.2	3.1	7.0	2.8	7.0	4.4	4.7
Average	5.3	4.4	5.0	4.4	4.6	3.8	2.5	4.6	2.1	3.1	7.0	3.4	7.0	4.4	5.0
Total	5.0	4.0	4.7	4.6	4.4	4.0	2.4	3.8	2.4	2.9	6.9	3.6	6.8	4.8	5.1
<b>Overall User</b>	<b>4.1 (all); 3.5 for academics</b>														

**Table 7-3 Servqual comparison – Actual services**

IT perception of the service rendered is higher than user perception, except for RU in the measure of “Responsiveness”, where the opposite is true – this may be because the RU IT Division has higher expectations of the service they wish to deliver in this respect. In the case of UFS and UFH, the academic point of view is more negative than that of the other users, while the administrative view is close to the IT view. At UFS, IT views their service as nearly perfect (6.9), a perception not as enthusiastically shared by users, although Administrative views are very positive also (6.8). As mentioned in Section

7.8.1, this corroborates the view that senior administrators are happy with the support from IT at this institution. The item “Inform users regularly about the status of users' requests” is on average the item with the lowest score across all three institutions.

What users see as achievable information services may be insightful, as it can perhaps point to common problem areas at the three institutions. These ratings are highlighted in Table 7-4 (the responses are not shown for sub-categories of users).

<b>Q2.4 Servqual: POSSIBLE services rendered</b>						
	<b>RU</b>		<b>UFH</b>		<b>UFS</b>	
<b>Services</b>	<b>IT</b>	<b>User</b>	<b>IT</b>	<b>User</b>	<b>IT</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>						
When promising to do something by a certain time, do so	5.5	5.5	7.0	5.1	6.0	5.5
Perform the service right the first time	5.0	5.8	5.0	5.3	5.0	6.2
Inform users when request can be completed	6.0	5.5	7.0	5.4	7.0	6.3
Inform users regularly about the status of users' requests	6.5	5.7	7.0	5.1	7.0	6.4
Provide services at the time they promise to do so	5.0	5.7	5.0	5.7	6.0	6.0
Average	5.4	5.6	6.2	5.3	6.2	6.1
<b>Responsiveness: Excellent information services will</b>						
Have operation hours convenient to all their users	5.5	5.8	6.0	5.3	7.0	6.3
Give prompt service to users	5.0	5.4	7.0	4.9	7.0	6.2
Always be willing to help users	5.5	6.1	7.0	5.6	7.0	6.5
Never be too busy to respond the users' requests	4.5	4.8	5.0	5.4	7.0	6.2
Average	5.8	5.5	6.3	5.3	7.0	6.3

Services (ctd.)	RU		UFH		UFS	
	IT	User	IT	User	IT	User
<b>Assurance: Employees in excellent information services will</b>						
Instil confidence in users by their behaviour	7.0	5.6	7.0	5.8	7.0	6.7
Be consistently courteous with users	6.0	5.8	5.0	5.9	6.0	6.7
Have the knowledge to answer users' questions	6.5	5.8	3.0	5.7	7.0	6.5
Average	6.7	5.7	5.0	5.8	6.7	6.6
<b>Empathy: Excellent information systems employees will</b>						
Give users individual attention	5.5	5.4	7.0	5.5	7.0	6.7
Have employees who give you personal attention	5.0	5.2	7.0	5.3	7.0	6.5
Have the users' best interests at heart	6.5	5.8	5.0	5.8	7.0	6.8
Understand the specific needs of their users	7.0	5.7	6.0	5.8	7.0	6.6
Average	5.8	5.5	6.3	5.6	7.0	6.6
Overall Category Average	5.9	5.6	5.9	5.5	6.9	6.5
<b>User Average for HEIs</b>	<b>6.1</b>					

**Table 7-4 Servqual comparison - Possible Services**

In most cases, IT perception of what is possible is higher than the users' perception. There seems to be a high confidence level at UFS in the abilities and resources available, and slightly less so for RU and UFH. Analysis of the table does not reveal inter-organisational commonalities. The gap between "Possible" and "Actual" is insightful for the relevant institutions, but does not add value in inter-institutional comparison.

However, the average gap between possible (6.1) and actual (4.1 for all, 3.5 for academics) points to the necessity for intervention.

Overall the service quality could be improved at all institutions, according to academics and students especially, and is alarmingly low at UFH for these user categories.

### **7.12.2 Helpdesk**

Helpdesks exist at all three institutions. The services offered vary across the institutions. At RU, there is a request tracking service and requests for help on hardware and software as supplied by the institution are supported. At UFS, staff have a helpdesk facility with a 24 hour turn-around on hardware queries. Student queries are handled by tutors in the laboratories. At UFH, this function exists on the city campus for all university supported hardware and software, but the service is not well-defined nor well resourced, and the existing web link is uninformative, so proves to be a source of frustration to users. On the main campus, the laboratories are not well maintained, and at the time of writing, there is no reporting system for problems.

### **7.13 *Robustness of services and architectures***

RU has a stable infrastructure. There have been disasters such as an email crash in 2004, and a successful security probe from outside, but these have been countered and recovered from. The infrastructure is perceived as reliable, and graphs of downtime and availability are published openly. UFH is in process of establishing a robust infrastructure. The new installation has caused a number of interruptions of service, but at present there is more stability. UFS appears stable, except that there are complaints (especially from students) that server downtime is a problem. All note security and virus protection, and spam protection as major focus areas. Of course, the management of storage is a cause for concern as students download non-academic material (music and films) which consume bandwidth and storage space.



## **7.14 Systems portfolio to support information needs**

### **7.14.1 Microsoft and open source**

None of the three institutions is driving open source software to any extent. All are using the Microsoft academic license for desktop software. UFS is using Microsoft network software, whereas RU is still using Novell Netware. RU does have a computer laboratory funded by the Shuttleworth foundation which has the express purpose of providing training on open source products. The trade-off between the costs of open source versus the support has been mentioned by respondents as a factor in this decision, as a large proportion of HEIs in South Africa is being very well supported by Microsoft.

### **7.14.2 ERP systems**

The three institutions differ in their choice of ERP systems. This is interesting in terms of examining which choice could best provide a University with its information needs.

RU has a home-grown system which is flexible. For direct users, the RU system with its “green screen” interface is viewed disparagingly: it does not meet the criterion of “user-friendly” at present, but the human intermediary (Data Manager) does! Access to the ERP system is generally available, but vetted by the Registrar. This is for security reasons as, for example, payroll information should ideally not be universally visible. It does not meet the needs of academic managers, epitomised by the parallel systems that exist (Section 7.8.2). There is flexibility in the system as a request to the Data Manager is usually effective.

UFH has an ERP system, specifically designed in South Africa, but used internationally for tertiary institutions (ITS<sup>®</sup>). It was built to be used by Technikons which had rigid structures, and has later been adapted for Universities. Access to the system at UFH was restricted, because of the license limit on the number of users, and Deans had to request the Registrar for access (an indication of where control over information lay!). This has changed and academic secretaries and faculty managers, HoDs and Deans now have access, and training is being made available in certain areas of the system.

Administrative staff interviewed express satisfaction with the areas they are allowed to access. Few academic Deans or HoDs use the system directly at present. It is seemingly a very rigid system, and the way it is used restricts the possibility of flexibility. Despite being built specifically for HEIs in SA, it does not seem to match the academic reality—for example, senior administrators insist that it is not possible to offer the same six month course in the two semesters of the same year – the course may be offered only once.

UFS has an ERP that has been newly installed. The PeopleSoft system<sup>®</sup> is a system created in the United States and has been adapted to offer modules that would apply to Universities. There is predictably discontent with the new system. The installation was a cutover installation that caused a great deal of work. Users were used to the old customised system, and processes have had to be adapted to fit the system as the American system does not support SA realities completely (dual language use is an example). There are very few direct users, although there does not appear to be a policy to restrict access. For academic managers, access to the necessary information is tortuous and unsatisfactory. Parallel academic systems exist. Other software packages have been acquired to provide support for academic service like timetabling, which an ERP system should be expected to cater for. Some process reengineering occurred which is viewed as good.

The views of the ERP were examined further through a narrow (limited number of respondents) EUCS survey (McHaney *et al.*, 1999). The comparative results can be found in Table 7-5. The scale for this survey is 1 to 5 where 5 represented “the best”. “User” in the table represents the average of non-IT responses for each institution.

<b>Q2.3: Use of Enterprise System</b>									
<b>Quality of ERP system</b>	<b>RU</b>			<b>UFH</b>		<b>UFS</b>			
	<b>Ac</b>	<b>Ad</b>	<b>User</b>	<b>User</b>	<b>IT</b>	<b>Ac</b>	<b>Ad</b>	<b>User</b>	<b>IT</b>
Does the system provide you with the precise information you need?	2.0	4.0	2.5	1.0	4.0	2.8	4.0	3.4	4.0
Does the information content meet your need?	2.5	4.0	2.9	1.0	3.0	2.2	4.0	3.1	4.0
Does the system provide reports that seem to be just about exactly what you need?	3.0	3.7	3.2	1.0	3.0	1.8	4.0	2.9	3.0
Does the system provide sufficient information?	2.0	4.0	2.5	1.0	4.0	2.0	4.0	3.0	3.0
Is the system accurate?	5.0	4.0	4.8	1.0	5.0	3.0	4.5	3.8	5.0
Are you satisfied with accuracy of the system?	5.0	3.7	4.7	1.0	5.0	2.2	3.5	2.9	4.0
Do you think the output is presented in a useful manner?	2.0	3.7	2.4	1.0	5.0	2.8	4.5	3.7	4.0
Is the information presented clearly?	2.5	3.7	2.8	1.0	5.0	3.0	5.0	4.0	5.0
Is the system user friendly?	1.5	3.3	2.0		4.0	2.0	4.0	3.0	5.0
Is the system easy to use?	1.5	3.3	2.0		4.0	2.0	3.5	2.8	5.0
Do you get the information you need on time?	3.5	4.0	3.6		5.0	2.4	4.5	3.5	5.0
Does the system provide up-to-date information?	4.0	4.0	4.0	1.0	4.0	3.0	4.5	3.8	5.0
Is the system robust?	5.0	4.0	4.7		4.0	2.6	3.0	2.8	4.0
Are the services always available?	3.0	4.0	3.3		3.0	3.2	4.5	3.9	4.0
Can you tailor the output to your needs?	1.0	3.0	1.5		3.0	2.0	4.0	3.0	5.0
Is it easy to get the exact information you need?	2.5	3.3	2.7	1.0	3.0	2.0	4.0	3.0	5.0
Overall Average	2.9	3.7	3.0	1.0	4.0	2.4	4.1	3.3	4.4
<b>User Average for HEIs</b>	<b>2.4 or 3.2 (ignoring UFH)</b>								

**Table 7-5 Enterprise system supporting information needs**

The IT responses for UFH and UFS are similar. At RU, an IT response was not requested.

More insightful is the difference between the IT and user response for UFH and UFS. At UFH, the difference is particularly large. The UFH's respondent is totally computer literate and a senior administrator, and is particularly negative about the usefulness of the system.

Comparing user categories of RU and UFS, it is clear that the academic perceptions are more negative than the administrative perceptions, and in the case of UFH, even more so.

Although the support systems are on the whole fairly standard, academic course structures and course histories are quite complex and the statement is made that even if staff have access to the systems, it would be difficult for them to get the information they need unless they are expert at the underlying structures. They can easily access information, interpret the findings incorrectly and make bad decisions based on this - it could be dangerous (ITMgm, RU, 2004).

More research is required to assess which of the options is the best choice, although the answer is likely to be context specific.

### **7.14.3 Other systems**

Both RU and UFS report the purchase and use of other software applications to support users, implying that the ERP system is not totally comprehensive. Added to this are the plethora of academic systems (spreadsheet mainly) used for academic and course management.

### **7.14.4 Portfolio comprehensiveness**

The range of systems to support typical University functions is examined from the author's generated list and the comparative results can be found in Table 7-6 as "percentage completeness".

<b>Q2.1: Portfolio Comprehensiveness (Percentage)</b>			
<b>System Types</b>	<b>RU</b>	<b>UFH</b>	<b>UFS</b>
Administration needs	84.3	68.8	100.0
Student Services	86.8	63.2	72.0
Administration services for students	73.1	22.2	33.0
Academic needs	85.7	14.3	83.0
Library Services	100.0	100.0	100.0
IT Management systems & web features and applications	90.0	80.0	100.0
<b>Average</b>	<b>86.7</b>	<b>58.1</b>	<b>81.3</b>

**Table 7-6 Portfolio of systems: Percentage completeness of provision**

The library systems are rated as good (at 100% for all three institutions). Both RU and UFS have good coverage otherwise. The lowest coverage for all three is in the category “Administration and academic services for students”, with those of UFH and UFS seemingly far too low. Academic systems at UFH also have low coverage. UFS scored a 100% for administrative needs, again supporting the expressed satisfaction of administration for the IS/ICT service. UFH’s low rating can be attributed to the fact that there is a lack of a single person responsible for the IS/ICT function as a whole.

## **7.15 Quality of information**

This section overlaps somewhat with the discussion of the previous sections.

### **7.15.1 Government**

The need to report to Government regarding the national plan and especially for subsidy earning purposes can be seen as the responsibility of top management. The furnishing of HEMIS data is used here as an indication of the support of top management by means of IS/ICT’s provision of information.

RU specifically mentions success at providing quality HEMIS information (SAd, 2004<sup>4</sup>). UFS mentions problems with “incorporation data”, and the need for a HEMIS add-on software system, a “HEMIS analyser”, to provide clean and correct data. UFH has had historic problems with providing accurate HEMIS data, now compounded with incorporation data. The reengineering process will hopefully counteract this problem.

### **7.15.2 Executive management**

Executive management of RU and UFS (not unexpectedly) state that they get the information they need (UFH’s opinion is not voiced). RU states that this is not necessarily provided through IS/ICT, as external information needs are met by other means. UFS similarly states that all information needs are met, especially through the services of the Planning Unit.

### **7.15.3 Academics**

Senior academics, as already noted, point to their changing role and their need for accurate information. Information is required regarding success rates on courses in order to pinpoint problem areas. Similarly, information is required about progress of students who have been accepted against their Swedish point scores. This is vital in light of the new matriculation context where such scores will no longer be valid. At RU and UFS, concern is expressed at the lack of this type of information. Academics did not seem to have as close a relationship with the IT function, especially at UFS and UFH, and this appears to be a major area of concern – their information management needs are not being met. (Conspiracy theorists might say that this points to the diminishing power of academics in the organisation!)

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<sup>4</sup> As noted in the glossary, the term “SAd” refers to a Senior Administrative staff member.

#### **7.15.4 Administration**

Senior administrators at UFS and RU are particularly happy with the way in which their information needs are being met. The interaction between IT and Senior Administration is evidently largely good. This is to be expected given the reporting structure. Few middle level administrators have been interviewed, but one voiced the opinion that their needs are not well met at RU, and this points to the breakdown of the role of the intermediary – information should be available regardless of personalities. The support the ERP system gives is explored (Section 7.14.2), and substantiates these perceptions.

#### **7.15.5 Students**

Student society support is non-existent at UFH, while at RU, the SRC's past president complained about the lack of systems to support the SRC activities, such as support for societal finances, databases of student data, among others, as well as similar support for student societies. UFS students interviewed thought the support not problematic and that WebCT<sup>®</sup> supported student needs adequately. UFH students, especially on the newly incorporated campus, are more negative overall with respect to the processes and support they are receiving from staff and systems.

### ***7.16 Information behaviour: Information and technology “literacy”***

The author has posited that the use of technology and information literacy will be a contributory factor in the use of software and electronic information, as well as being a block to electronic communications.

The perception survey results are compared (after a percentage rating is calculated from the responses) to decide whether literacy and electronic media usage is problematic at the three institutions.

## 7.16.1 Literacy levels

Table 7-7 compares perceived computer literacy levels shown as a percentage of the possible maximum rating for the different categories across the institutions.

<b>Q7.1: Computer Literacy (as a percentage)</b>				
<b>Category</b>	<b>Type of system</b>	<b>RU</b>	<b>UFH</b>	<b>UFS</b>
Admin	Email	77.2	90.9	76.7
	Word-processing	74.8	84.8	73.3
	Spreadsheet Use	54.7	66.7	70.0
	Administration system use	64.1	70.0	74.4
	Database queries	30.4	59.3	54.4
	Internal Information seeking on the web	53.2	56.7	64.0
	External Information seeking on the web	45.5	56.7	62.7
	Electronic library usage	21.8	42.4	56.7
	Average	52.7	65.9	66.5
Academic	Email	86.5	93.9	87.8
	Word-processing	82.1	90.9	85.6
	Spreadsheet Use	58.3	60.6	78.9
	Administration system use	37.7	46.7	61.1
	Database queries	37.3	40.7	72.2
	Internal Information seeking on the web	71.8	60.0	76.7
	External Information seeking on the web	75.0	76.7	80.0
	Electronic library usage	69.5	63.6	73.3
	Average	64.8	66.6	76.9
Students	Email	88.8	78.8	71.1
	Word-processing	81.7	66.7	63.3
	Spreadsheet Use	55.0	36.4	58.9
	Administration system use	30.0	36.7	56.7
	Database queries	19.4	33.3	48.9
	Internal Information seeking on the web	69.9	63.3	67.8
	External Information seeking on the web	81.3	70.0	68.9
	Electronic library usage	65.0	51.5	67.8
	Average	61.4	54.6	62.9

**Table 7-7 Literacy**



Email and Word-processing literacy is high at all three institutions for all categories of users. In all three cases, student literacy is surprisingly low. At UFH, student literacy rates for other software is in general lower than at the other two institutions. This reflects the educational background of a large proportion of the students.

UFH's administrative staff are perceived to be more literate than the other two institutions as are the academic ratings. At both RU and UFH, academic literacy for administrative systems and database queries is low.

### **7.16.2 Media usage**

Perceptions regarding media usage are compared next.

The fact that the questions differed makes comparisons largely invalid (percentages do not add up to 100% per group category as these user responses have been averaged by medium). However, it is clear that for communication with students, personal contact is most used on average, somewhat surprisingly. At UFH, the telephone is the most important medium and email second for communicating with administration and academics, while email is more important at the other two institutions. Personal contact with academics is pervasive at RU and this corresponds with the close-knit context of the University community.

### 7.16.3 Media effectiveness/responsiveness

How responsive the sectors of the Universities are to various communication types is indicated next by asking what percentage of the communications were responded to:

<b>Q3.3 Media Effectiveness/Responsiveness (shown as percentages)</b>				
<b>Category</b>	<b>Media</b>	<b>RU</b>	<b>UFH</b>	<b>UFS</b>
Admin	Email	84.6	80.0	91.0
	Office voicemail		51.9	
	Cell phone voicemail	49.3	56.7	39.3
	Written	75.8	55.0	61.2
Academic	Email	85.3	80.0	75.5
	Office voicemail		48.1	
	Cell phone voicemail	61.4	56.7	63.5
	Written	72.7	71.7	55.6
Students	Email	80.0	59.3	53.2
	Office voicemail		40.7	
	Cell phone voicemail	49.4	48.1	59.5
	Written	57.1	51.9	32.8

**Table 7-8 Responsiveness/ Effectiveness**

RU’s email response is good across categories. Students appear generally less responsive to email except at RU, and surprisingly unresponsive to written communications at UFS. What is perhaps insightful are the lower levels of response in cases. All responses at < 60% have been bold-typed, and in this respect, UFH responsiveness would seem low.

#### 7.16.4 Media efficiency/promptness

The speed with which responses are effected is next compared on the question “How prompt were the responses on a scale of 1 to 5 where 5 is very prompt.”

Once again, the lower levels are insightful (<2.5 have been bold-typed). Students seem to be particularly slow responders at all institutions.

<b>Q3.4 Media Efficiency/ Promptness</b>				
<b>Category</b>	<b>Media</b>	<b>RU</b>	<b>UFH</b>	<b>UFS</b>
Admin	Email	3.5	3.5	3.6
	Office voicemail		<b>2.4</b>	
	Cell phone voicemail	2.6	<b>2.0</b>	<b>2.1</b>
	Written	3.2	3.8	<b>2.4</b>
Academic	Email	4.1	3.8	4.0
	Office voicemail		3.2	
	Cell phone voicemail	3.4	3.2	<b>2.3</b>
	Written	3.4	3.3	2.8
Students	Email	3.3	<b>2.4</b>	2.5
	Office voicemail		<b>2.0</b>	
	Cell phone voicemail	3.1	<b>2.2</b>	2.6
	Written	2.7	2.6	<b>1.8</b>

**Table 7-9 Media efficiency/promptness**

Academic response efficiency is perceived as highest across the institutions, and email responsiveness as the best across media. Students at UFS and UFH were the least responsive.

Overall, on examining the results of these questionnaires, it would appear that media usage can be improved, but on the whole the concept of “information and technology literacy and usage” does not appear to be a major problem area, except where issues have been highlighted with bold-type. What does arise from this analysis is that, not surprisingly, email is used widely and effectively. Email is used more and more as a vital repository of documentation on institutional activity, and highlights concern that it is not managed as such. Storage, linkage between email and calendars, and linkage between relevant email messages are among the issues that need management.

## ***7.17 Transformational alignment***

### **7.17.1 Transformation**

The term has been defined in two different ways: firstly, in the accepted usage of the term as defined especially by Government in South Africa in terms of redress, and secondly in a wider sense as “changing deeply”. The three institutions chosen as case studies have been involved in changes and are required to meet the transformational goals set by Government. The new quality framework and subsidy focus on research impacts on all of them with different deadlines. RU undertook an internal quality audit in 2005, whereas the other two are still preparing for their different audit deadlines. UFS and UFH have had to cope with financial “turnarounds”, as well as incorporations. In addition, UFS has had to cope with the cutover installation of a new ERP. These two institutions can be said to be transforming in the wider sense of the word. RU has had a calmer environment, coming from a stable financial situation and the lesser “evil” of divesting a city campus that had somewhat complicated its operations for the last 20 years. It is changing to meet Government requirements, so it can be said to be transforming in the narrower definition, albeit slowly according to some staff members.

As stated, UFH and UFS have been and are undergoing major changes, not least of which has been the incorporation of other campuses with different cultures and values, and posing new management challenges at all levels. Multiple campuses rely heavily on robust IT infrastructure and an electronic communication culture.

This section examines the use of IS/ICT on mergers and incorporations, as well as the newer areas of community projects, but then focuses on Communication and Knowledge management as areas where IS/ICT can profitably be used for softer issues such as facilitating interaction to create unifying cultures, allowing minority voices to be heard and supporting knowledge sharing for both academic and non-academic purposes.

#### **7.17.1.1 Mergers: incorporations and divestitures**

##### ***7.17.1.1.1 Technology for geographical dispersion***

Technology to support multiple campuses is used at UFH and UFS. The architecture supports a unified organisation and systems are centralised. The telephone system at UFH is not yet centralised so calls have to be made through the public telephone system. This is a major expense for the University. It is not clear whether UFS has a centralised telephone system.

Videoconferencing is used at UFH and UFS to improve on travelling time for meetings. At UFH, the quality of the line is problematic. At UFS, line quality has apparently been improved to such an extent that the V-C meets with campus management at the distant campus by videoconferencing on a weekly basis. RU uses their equipment for external contacts and teaching between RU and UFH campuses.

##### ***7.17.1.1.2 IS and data impact***

At UFH, the use of the ERP system has caused problems with flexibility. Senior administration are categorical that the system is unable to handle the complexity of allowing for different course structures as well as the merging of course structures from two different institutions, and can not support modules being offered flexibly. For example, offering a module in either or both of two semesters is prohibited (as mentioned

in Section 7.14.2). (The package providers deny that modularity and attendant flexibility is not supported by the system.)

The impact of incorporation on data quality was perhaps underestimated at UFH prior to incorporation, and at both UFH and UFS the incorporation has created the necessity to “clean up” the incorporated data. Even at RU, the need to maintain the pipeline student records has been an extra workload, also with unanticipated problems. Disparate IS/ICT systems (as well as different course structures, rules and processes in the institutions) have caused problems.

#### **7.17.1.2 IT support: community projects and third stream funding**

Systems exist to support community projects and third stream funding administratively, but little is available to support the knowledge management aspects of these projects.

### **7.17.2 Communication Management**

Communication Management is driven through other units, not the IT Division, at all three institutions. The IT Division provides a service for this function. However, there is little strategic management done for the use of IS/ICT to support tacit KM or communications. Communication Management as a way of supporting multiculturalism is not used – students and staff of “different” cultures are not explicitly supported. The exception is language translation as used at UFS. WebCT<sup>®</sup> in the case of UFS is seen by students as supporting communication between students and lecturers.

#### **7.17.2.1 IT support: multiculturalism**

At UFS, translation software is used in management meetings. At present, this technology translates between English and Afrikaans. Sesotho is not being considered yet.

No specific technology, such as web usage, is available that allows for junior staff and minority staff voices to be more visible to top management. This may not be

problematic at the smaller Universities, but could be so at UFS, where the contact is far less personal.

#### **7.17.2.2 Email**

The one shining exception of where IS/ICT is used for communications is email. As noted earlier and supported in the surveys, email has become the one technology that is vital for the staff at the institutions. Robustness of email is critical as so much dependence is being placed on this. Whilst not specifically a research tool, email supports research. Email management such as spam management, managing email overload, and backup and recovery is vital.

#### **7.17.2.3 Intranet**

All three Universities have web presences. UFH's was non-functional/ non-existent until late 2005 and is in a state of development. UFS notes that theirs is static, although, to an outsider, there appears to be a wealth of information on it. RU's is arguably more interactive, as there is a student newsgroup. UFS has a dual language feature (English and Afrikaans), but does not support Sesotho, arguably the language of choice for a large group of students, and nor does UFH support Xhosa at present.

None of the institutions are making use of portal software.

Management at RU uses the discussion group to keep in touch with the issues that concern students, whilst at UFH and UFS such discussion groups are not available at the time of writing.

#### **7.17.3 Knowledge Management**

KM is equated in this research with explicit KM supported by IS/ICT. The existence of KM is especially relevant in times of change, specifically with regard to knowledge capture and sharing.

One of the issues in KM is Intellectual Property (IP), and RU and UFH mention IP on being questioned about KM, but no specific IS/ICT support for IP is mentioned by any of the institutions.

Universities are knowledge producing and disseminating institutions, as part of the core operations. The Libraries and the research publications are examples of the electronic storage and dissemination of research. The former in particular are very proactive in trying to meet the information needs of their users. KM and teaching and research activities are arguably less successful as discussed in Section 7.9. Portals span the boundaries of KM and academic and administrative systems, but are absent in all three institutions. (This is in contrast to the 46% of HEIs who reported having working portals according to the Green campus survey report of 2005 (Green, 2005).)

Two published questionnaires were used as a base to examine the practices at the institutions which could fall into the category of explicit KM, mostly supported by IS/ICT. However, the first instrument (by van Kouwenhoven, 1999) was found to be too long and complex for respondents, and this was discarded. The results from the remaining adapted KMAT questionnaire (from Maier and Mosely, 2003) can be found in Table 7-10 (with a rating scale of 1 to 5):



<b>Q4.2 Information behaviour/ Knowledge Management</b>				
<b>Knowledge practice</b>	<b>RU</b>	<b>UFH</b>	<b>UFS</b>	<b>Overall</b>
<i>An electronic knowledge base exists to store new ideas, knowledge, solutions, and best solutions. *</i>	2.3	1.3	2.1	1.9
<i>Documents are proactively shared with employees.</i>	<b>3</b>	2.3	<b>3.5</b>	<b>2.9</b>
<i>The development of job documentation is encouraged.</i>	<b>3.2</b>	1.3	<b>3.3</b>	<b>2.6</b>
<i>Information from many sources is stored in an (integrated manner) and cross-referenced, facilitating better communication and decision making.</i>	<b>2.5</b>	1.3	<b>2.5</b>	2.1
<i>Policies or technical security issues do not prevent the sharing of information and knowledge.</i>	<b>3.3</b>	<b>3</b>	1.8	2.7
<i>Documents can be posted on an organisational (intranet) portal or saved on a network server. *</i>	<b>4.4</b>	<b>3.3</b>	<b>4.2</b>	<b>4.0</b>
Proactive as members actively seek out and respond to changes in their competitive environment and think about how to use this information to enhance existing and create new products and services.	<b>2.9</b>	1.7	<b>3.9</b>	2.8
Information transparent as members trust each other enough to talk about failures, errors and mistakes in an open and constructive manner and without fear of unfair repercussions.	<b>3.2</b>	2	<b>3.9</b>	<b>3.0</b>
Incentives are in place that motivate staff to share knowledge. *	2.2	1.7	1.3	1.7
The generation of new ideas and knowledge is highly valued.	<b>3.7</b>	<b>2.7</b>	<b>3.2</b>	<b>3.2</b>
<i>The information and knowledge you receive is accurate and up-to-date.</i>	<b>4</b>	<b>3</b>	<b>2.8</b>	<b>3.3</b>
<i>An organisational intranet portal exists where information and knowledge relevant to job requirements may be retrieved.</i>	<b>3.5</b>	<b>2.7</b>	1.7	2.6

<b>Knowledge practice (ctd.)</b>	<b>RU</b>	<b>UFH</b>	<b>UFS</b>	<b>Overall</b>
<i>It is common practice to store work documents on an organisational server, rather than on personal computers.</i>	2.3	2	2.4	2.2
<i>Electronic and/or non-electronic collaboration, teamwork, and cooperation are a part of doing business. *</i>	<b>3.7</b>	<b>3.3</b>	<b>3.4</b>	3.5
<i>Information is stored and organised in a way that makes it (intuitively) easy and quick to locate.</i>	<b>2.7</b>	1.3	<b>2.5</b>	2.2
<i>Advanced technologies, (such as data warehousing, mining, and modelling), are used to leverage data and information for strategic and operational decision making. *</i>	2.2	1.8	1.1	1.7
<i>Documents stored on an organisational server or intranet contain timely and useful knowledge for our job responsibilities.</i>	<b>2.8</b>	1.3	<b>2.5</b>	<b>2.2</b>
<i>Expert systems and knowledge bases are used to aid in decision making.</i>	<b>2.6</b>	1.8	<b>2.6</b>	<b>2.3</b>
Average	<b>3</b>	2.1	<b>2.7</b>	<b>2.6</b>
<b>Overall Average across HEIs</b>	<b>2.6</b>			

**Table 7-10 Knowledge Management/Information Behaviour**

While the focus is on IS/ICT supported KM, it can be seen that this questionnaire is wider than that – probing issues that do not require IS/ICT intervention. The issues that directly mention IS/ICT support have been shown in italics.

All items scoring an average larger than 2.5 (the mid-point) have been bold-typed. As can be seen, RU has a slightly better profile than UFS and UFH, but the ratings especially for UFH are low.

Some of the answers contradict responses from interviews, but this can be explained by the perspective of the respondent. For example, the lack of quality of information for Government purposes has been noted for UFH, and yet the question “The information

and knowledge you receive is accurate and up-to-date” scored a 3. This points to a lack of awareness, which should be concerning to the institution.

Other issues tally with evidence from interviews, for example the lack of information stored regarding teaching, for example, course content. The issues that are either high across the respondents or low on average, have been marked with asterisks.

Low scoring issues were: “An electronic knowledge base exists to store new ideas, knowledge, solutions, and best solutions”; “Incentives are in place that motivate staff to share knowledge” and “Advanced technologies, (such as data warehousing, mining, and modelling), are used to leverage data and information for strategic and operational decision making”.

High scoring issues were: “Documents can be posted on an organisational (intranet) portal or saved on a network server”; “Electronic and/or non-electronic collaboration, teamwork, and cooperation are a part of doing business”.

In the author’s opinion, more focus should be placed on KM issues, especially in a changing environment.

## **7.18 Summary**

The preceding discussion examined the antecedent factors suggested in the model in Figure 7-1. The salient points of the discussion are summarised in the table that follows, Table 7-11, against the antecedent factors. The numbering system on the left refers to the factors in the model. A rating for the suggested factors across the three case institutions is proposed. The rating is a subjective assessment by the author, using a scale of 5 = “Good, satisfied the criteria”; 3 = “Intermediate”; and 1 = “Bad, satisfies no criteria”. This is followed by comments summarising the preceding discussion.

<b>Checklist of performance</b>			
<b>Factor</b>		<b>Rating</b>	<b>Comment</b>
<b>Primary Factors</b>			
I	Organisational strategic management for change	3	The institutions have strategic plans in place, but at only one is this followed by explicit implementation strategies. At one other, a Balanced Score Card system is in process. At the third, the strategies are not guided by specific management techniques.
1	Quality of SIPM	1	Low to non-existent formal SIPM at all three institutions, with no KM and CM components.
2	Support for emergent strategies	2	In one of the institutions, there is some flexibility, but in the other two the ERPs are rigid. Flexibility is restricted by the application systems although the robust architectures reported at the three institutions allow for flexible support.
3	Support for specific management information needs (mixed mode management)	2.5	Two-way information flows could be improved in order to act as control loops for decision-making, although in two cases, published information is available. Paperless meetings at one institution improve the decision-making speed. Targeted information for improving decision-making is not being produced.
4	Support for academic management and core process information needs	1	This is an area where improvement is required as it is a source of dissatisfaction at all three institutions.  There is a move to mixed-mode eLearning, but KM systems to support research are not obviously evident.
5	Support for support unit information needs and reengineering processes.  Student Societal and other needs	4	Generally the support units are well supported, but student services are still viewed as poor at two of the three institutions and no portals exist at any of the institutions. HR systems are not particularly well thought of at two institutions.  Student needs are not well met for functioning of student societies at RU but was not mentioned as problematic at the other two HEIs

	<b>Factor (ctd.)</b>	<b>Rating</b>	<b>Comment</b>
<b>Secondary Factors</b>			
A	Quality of IT management and governance	3	This varies across institutions, but common to all is the fragmented role of IT management and the lack of strategic leadership.
B	Quality of IT Service	3	This varies across institutions, but generally viewed poorly by academics and students and highly by highly placed (senior) administrators.
C	Robustness of infrastructure	4	This appears to be commonly viewed as good, with two institutions being particularly favourably viewed.
D	Portfolio of systems	3.5	Some areas need attention: Research systems, Course Management, Student Affairs.
E	Quality of information	3	Varies across the institutions, with “poor” at one institution (rated by author at 2), while another was rated at 4. This is the information provided externally as well as internally.
II	Information Behaviour	3	KM and CM not full exploited to support transformational aspects although the media literacy of institutions appears satisfactory.
<b>Overall Indicator</b>			
III	Alignment	2.3	The average measure of alignment as per the alignment questionnaire is supported by comments made by interviewers as a fair reflection of the three institutions, and shows the need for improvement.

**Table 7-11 Rating on antecedent factors**

The ratings and comments are expanded upon in the next chapter where the model is reflected upon.

## **7.19 Exploratory Areas**

### **7.19.1 IT leadership**

Given the structure of IS/ICT, the role of IT in leading the use of IS/ICT is muted at all three institutions. In order to raise the impact and profile of IS/ICT, more proactive leadership is required. This is easy to say, but the IT function needs to be given the “space” or resources to be able to do more than react.

### **7.19.2 Feedback loop**

The use of feedback loops for monitoring is not in evidence in any innovative way. The reports for financial control exist, but reports on issues of strategic importance do not. Examples of this would be information on student throughput, in a drill down fashion. Information that does exist is not necessarily easily obtained.

### **7.19.3 Process reengineering**

RU has used IS/ICT to reengineer student administration systems in order to increase efficiency. UFS has installed a new ERP and are thereby reengineering the administrative processes. The jury is out on whether or not this is more efficient and effective, as the system is still being bedded down. At UFH, the Registrar’s Division has embarked on process reengineering to improve the efficiency and effectiveness of the processes, and the use of the ITS<sup>®</sup> system to support this is a given.

### **7.19.4 South Africa**

The larger issues impacting on HEIs in South Africa at all levels have been dealt with in the discussion above: the need to transform and the issues which this entails such as multiculturalism and student diversity in terms of learning and cultural identity. The specifically South African IT issues such as lack of human resources, broadband speeds and costs, cost of technology, and computer literacy as related to HEIs have been remarked on. Speed of the Internet is a major problem with respect to research, and

bandwidth management is a priority for IT Directors. The cost of hardware is a problem in South Africa as import surcharges add to the costs. Most software is also imported. Fortunately, merger funding has been made available by Government to support the Universities involved in incorporations, specifically for IT.

### **7.19.5 Achievements**

RU mentions the SEALS project and bandwidth control as successes, as well as network redundancy and therefore reliability of the ICT infrastructure; UFS mentions the wiring of residences and the use of technology for meetings, as well as the installation of the new ERP and innovation by staff in network issues; UFH cites the new network installation as an achievement.

## **7.20 Conclusion**

This chapter has compared and contrasted the three cases using the analysis framework with reference to the proposed model.

The formal information needs of all sectors of the organisations are being met satisfactorily, with the glaring exception of academics, where support for academic management appears problematic. This is particularly stated at UFS. The “softer” issues such as IS/ICT support for cultural diversity are not specifically planned for. Efficient and effective use of technology as a medium is least positively employed by students.

The next chapter re-examines the problem statement and premises from Chapter one in the light of the findings and proposed areas where IS/ICT usage could be better employed.

## **Chapter 8 Conclusion**

### **8.1 Abstract**

The final chapter examines the premises from Chapter one for corroboration or refutation, given the findings from the case study and the reviewed literature. The usefulness of the framework or model as an analysis tool for assessing the alignment of IS/ICT and HEIs in a changing context is then discussed. Proposals are also made regarding the potential use of IS/ICT for a transforming HEI. It concludes by suggesting further research.

### **8.2 Introduction**

The research is motivated by the changes experienced (and being experienced) by HEIs in South Africa in the first part of the 21<sup>st</sup> Century where, in line with the political changes occurring: “The transformation of the higher education system to reflect the changes that are taking place in our society and to strengthen the values and practices of our new democracy is, as I have stated on many previous occasions, not negotiable. The higher education system must be transformed to redress past inequalities, to serve a new social order, to meet pressing national needs and to respond to new realities and opportunities” (Department of Education, 1997a). The question is specifically what support could be offered by IS/ICT to the HEIs in SA.

The research thus examines the support for HEIs in a changing context as offered by IS/ICT. It questions the usefulness of (rational) management techniques for organisations in a changing environment, the use of these techniques in HEIs (given their arguably “different” structures and processes), and then the usage of IS/ICT to support organisations and particularly HEIs at strategic and tactical/operational managerial levels in such a changing environment. The nub of the research is the role of IS/ICT in transforming HEIs.



The research employed a case study approach in which three SA HEIs were chosen and used as the basis of empirical research.

The chapters of the research first examine each of the problem statements in terms of existing literature. From this, a predictive model is derived that is used as the basis for examining the case studies of three HEIs in South Africa in terms of IS/ICT support for transformation.

The findings of the three case studies are compared and contrasted in the penultimate chapter.

This concluding chapter first examines the problem statement and sub-problems as stated in Chapter one. It analyses support for the premises, given the nature of case studies and the difficulties of using case studies for generalising. The chapter examines the predictive model (proposed in Chapter five) of the antecedent factors for the effective use of IS/ICT to support “transforming” HEIs, in the light of findings from the case studies, and especially so in areas where alignment is apparently failing. The chapter then reflects on the research method, and concludes by proposing future research.

### **8.3 Corroboration or Refutation**

This research examined how IS/ICT could support HEIs in a time of change in South Africa. The sub-problems and their premises are repeated from Chapter one, and the evidence from the case studies is used for corroboration or refutation.

#### **8.3.1 Challenges faced by HEIs**

**Sub-problem 1:** What are the challenges faced by HEIs particularly in SA in the changing global environment?

**Premise:** HEIs are being faced by massive change drivers especially in SA.

**Conclusion:** This premise is supported by the literature, and also by the studies at, especially, two of the three HEIs where huge levels of change are reported. The factors impacting HEIs in South Africa increase the necessity for change and

transformation in the narrower and broader definition of the term. Unique or particularly pertinent issues that arise are related to cultural diversity of staff and students, educational diversity of students (where mergers have occurred), reduced resources, and the greater accountability of HEIs to the State.

### **8.3.2 Management techniques and IS/ICT for change**

**Sub-problem 2:** What management techniques are used to enable organisations to survive and flourish in the context of change and how can IS/ICT support organisations in this context of change?

**Premise:** Proven management techniques exist to support organisations specifically in changing circumstances.

**Conclusion:** This premise is supported in the literature. A variety of management techniques from the rational school have been identified that are used by organisations to support their strategic management. Organisations in times of rapid change need to plan for change and therefore their analysis of the environment is even more critical. These techniques can assist in strategic planning and analysis. Management models also help analyse structures that are flexible.

Arguments regarding the limitations of rational management techniques exist, and are being incorporated into these techniques, for example, the issue of emergent strategies.

**Premise:** IS/ICT can support organisations in adapting to or initiating change.

**Conclusion:** This premise is partly supported and partly refuted by the literature. IS/ICT can support strategies and, in particular, strategies for change. IS/ICT can be the source of change strategies (where IS/ICT can be used innovatively, and perhaps change the focus of the organisation – the old competitive edge argument, which, while old, is still valid).

The structures of organisations to cope with change are identified as networked and decentralised structures. For these to operate optimally, information flows are required, and IS/ICT can obviously facilitate these network flows. Knowledge Management is seen as virtually essential for organisations to cope in times of flux, and IS/ICT's role in supporting aspects of knowledge management is widely agreed upon.

However, the commitment in terms of time for large scale IS/ICT investment is such that once embarked on, it is difficult to change if the circumstances change. IS/ICT in this respect is/can be a barrier to flexibility. Specific approaches need to be made to decrease this threat, such as through object orientated development, and web services.

### **8.3.3 Management techniques supporting HEIs**

**Sub-problem 3:** How can the preceding management techniques, particularly with regard to strategic management, be applied to HEIs, given their arguably more complex structures?

**Premise:** Management techniques can be applied to HEIs, and can provide useful insights.

**Conclusion:** This premise is supported by the literature as well as the author's use of management techniques as applied to HEIs in either "raw" form or modified by the author, and it is argued that these are useful tools especially for analysing the context of HEIs.

**Premise:** HEIs are in general not being managed strategically because they are "different" organisations. The level of strategic planning is low.

**Conclusion:** This premise is partially refuted by the literature and case studies. World-wide, HEIs are doing strategic planning. HEIs in SA are no different. They are being forced by Government to have 3-year plans. The literature notes that planning exists, but is often not followed up with implementation, and this holds for HEIs.

The HEIs investigated had strategic plans in place although only two revised annually. The level of strategic management appears lower as regards implementation, as techniques such as performance management systems are not in place at the HEIs investigated - although all institutions have strict budget controls in place. Both UFS and UFH are in the process of installing performance management systems.

**Premise:** Alignment is vital for IS/ICT to support organisations for all levels of strategic management – from planning and analysis to implementation and control.

**Conclusion:** Alignment continues to be an area of concern for CIOs: in 2006 it is predicted as the top management issue. It is thus perceived as vital, and alignment is viewed as more than strategic alignment, but to incorporate tactical and operational alignment – the implementation of strategic alignment.

### **8.3.4 Strategic management of IS/ICT to support HEIs**

**Sub-problem 4:** How can IS/ICT be managed strategically in HEIs in order to support transformation for HEIs to meet the challenges of the changing context?

**Premise:** IS/ICT strategic planning and alignment is in its infancy in HEIs in South Africa, but at the same time the level of strategic planning required depends on the nature and context of the HEI. IS/ICT strategic management, specifically to support change, has not been used widely enough in South Africa in HEIs.

**Conclusion:** This premise is corroborated through the case studies, but the inherent difficulty of generalising to all HEIs in South Africa is acknowledged. The literature, as well as the case studies indicate that strategic planning at HEIs is often technology (ICT) focused. Within the examined group of HEIs, none had formal SIPM in place: at one of the three HEIs, ICT strategic planning was in process for the following year; at another, informal alignment was mentioned as an unplanned for bonus. Alignment maturity as measured by the mini surveys are shown to be low to medium in the institutions.

The type of informal alignment processes at one HEI provides flexibility, and adaptation to emergent strategies, that formal strategic planning may not provide. However, larger organisations would find it difficult to adapt to emergent change in this informal way. Alignment for emerging strategies is not evident at the other two HEIs.

The premise thus holds for ICT strategic planning, but Information Management, Knowledge Management (KM) and Communication Management (CM), which could help support strategies for change, are minimal in the HEIs examined. Information systems planning is reportedly low at most HEIs globally. In the case of the three HEIs studied, this lack can partially be attributed to the fact that such responsibilities do not fall under one unit and diverse reporting lines exist.

For organisations that are information intensive, such as HEIs, IS/ICT should have an important role to be effective. This is not so at the three case HEIs: the importance of IT is not seen as strategic, if budgets and reporting lines are examined. The fact that IS/ICT is not seen as strategically vital places limits on the possibilities of innovative strategic use. This low strategic importance may be part of the reason for the diminished need for overly-formal planning, but in the author's opinion is not a healthy sign in HEIs.

**Premise:** The IS/ICT tools available for efficient (customer driven) systems are not being used adequately in administration or for core processes.

**Conclusion:** This premise is refuted by the fact that the primary support functions' administrative needs are largely being met at management and operational level in the cases investigated. From the case studies, as a group, administrators show themselves reasonably satisfied with the enterprise system, (with scores of 3.7 and 4.1 out of 5 at two of the HEIs), and as a group, relatively satisfied with the service being provided by IS/ICT (with scores of 4.6, 3.8 and 6.8 out of 7). The systems that are in place have high completeness percentages across all three institutions for this group. However, depending on where student services are situated, in this respect the premise is corroborated as these systems appear to have a low completeness rating in the surveys.

The information needs of students is at lower levels of completion than for other administrative needs, according to the survey conducted (administration needs of students: 73%, 22% and 33% completeness compared to 84.3%, 68.8% and 100% for administrative needs).

At the core value chain level, the premise is partially refuted as eLearning is being investigated and at one HEI, very clearly focused on. eLibraries are providing excellent support of research needs of students and academics (with a 100% completeness factor for all three institutions), although bandwidth proves a problem. However, there is a partial corroboration at teaching level, by the fact that teaching equipment is either not comprehensive or not managed well in the cases examined. Furthermore, the systems to support research dissemination are not being used.

At academic management level, however, the premise is corroborated strongly in the three cases, in that these information needs are not being met. The difficulties of accessing ERP systems on-line compounds the problem: at two of the institutions very few academic managers are accessing the system. The widely held theory that user involvement is vital in ascertaining and meeting the needs of users, has not been applied to academic management. For the group of academics interviewed, the perceived level of satisfaction from the survey on ERP usage was lower than that of the administrators (2.9 and 2.4 out of a score of 5 at two of the HEIs). At one HEI, in order to cope with this, a data-warehouse is being constructed to enable management information provision regarding students and courses. This was done despite having installed a costly ERP system which arguably should be providing such information. The information needs of academics and students are at lower levels of completion than for other groups according to the surveys conducted (student services 86.8%, 63.2%, 72.0% and administration needs of academic: 85%, 14% and 83%). For two of the cases, these percentages are lower than for the other categories, while at the other the reverse is true). The perceived support from the IT Division is also much lower for students and academics than administration according to the surveys conducted (student scores: 4, 2.4 and 4.8 out of 7 and academic scores: 4.6, 2.4. and 3.6 out of 7).

**Premise:** In order to adapt and flourish in a changing context, organisations need to be responsive, and their decision-making processes need to be efficient and effective and IS/ICT can support this need. This is not happening in the case in HEIs. In addition, the peculiar management needs of HEIs are not being sufficiently addressed.

**Conclusion:** HEIs have slow decision-making processes. At the one HEI, there is a means of fast tracking a decision because of the close-knit nature of the community, but at the other two, the decision-making processes are slow. This premise is corroborated in that IS/ICT has not been found that improves on the efficiency of the decision-making process. The difficulty of accessing MIS type information is mentioned. The ERP systems in use at one institution is used in such a way that there is no flexibility: an oversubscribed semester course cannot be offered in the second semester for example (and the system is blamed for its rigidity), nor can a module be moved to a different semester if a lecturer happens not to be available for a particular semester and cannot easily be replaced.

IS/ICT has also not been identified as aiding more effective decision-making. At the one institution, a senior academic mentioned that he would like information to be more targeted at his level of understanding to make effective decisions. IS/ICT has the potential to make information more user-friendly, but is not being used in this way. For two of the institutions, the premise is further corroborated in terms of the support offered for the specific management styles of HEIs. In two of the HEIs, information from meetings is not published or searchable electronically. (The third institution has material available and is expanding the capture of electronic management/meeting material). The premise is thus partially refuted in the case of the third HEI where meetings are electronic and translation software exists.

No feedback loops are in place to assess whether or not decisions made at, say, Senate are being implemented. Given the paper-intensive nature of decision-making, there is a

dearth of support for document management, and this applies also to administrative functions, where accountability can be enforced by a documented paper trail.

**Premise:** In order to adapt and flourish in a changing context, a “learning” networked organisation is reported to be the most successful. HEIs, despite their very nature as organisations of knowledge and learning, are not supported adequately as learning organisations in terms of Knowledge Management (KM) and Communications Management (CM). Similarly KM and CM are not being used to support a transforming or unifying culture. In addition, the information behaviour of the organisations does not support electronic KM and CM.

**Conclusion:** This premise is refuted partially by the type of information flow at one of the HEIs through subscribed email groups and discussion groups on the Internet. At two of the HEIs, the web sites provide a great deal of published information. The use of the intranet is at the level of publishing, characterised by one way flow of information, at two of the three institutions.

The premise is corroborated, however, by the difficulty of accessing MIS type information as mentioned. Interactive collaboration is not supported significantly. Multiculturalism is not specifically supported, for example, by supporting discussion groups on the web. At UFS, multi-linguism is supported with language translation software, and the web pages are translated into English and Afrikaans, but not Sesotho. At RU, student discussion groups are available which increases levels of communication, but minority staff and new staff are not explicitly supported by IS/ICT mediated communication. The KM maturity of the HEIs is not high, as judged by the survey instrument (with scores of 3, 2.1, and 2.7 out of 5 at RU, UFH and UFS respectively). Although KM is supported to some extent at research level, it is not planned for at a strategic level.

The information behaviour of the HEIs as measured by the author’s instrument for media literacy, responsiveness, and reliability did corroborate the premise – the levels appear



satisfactory. The author's view that computer literacy and media usage could be a stumbling block to use of information and systems is not supported.

HEIs in SA have had to adapt, but the need to be flexible and respond to market demand has been vitiated by the quality controls that have been put in place as well as legislation allowing institutions to offer only defined courses or programmes. Any emergent need identified by departments, for example, a need for a short course, or a different offering in the curriculum is subject to scrutiny of whether it is at the level at which HEIs operate – National Qualification level 6, regardless of whether the intention is not to gain subsidy but as a source of third stream funding. Any new courses at the legal level have to be subjected to Quality Assurance vetting, which can take more than six months. Thus the ability to adapt to market demand is severely constrained. The space to be flexible is therefore internal. This could include offering courses to improve throughput, by modularising the courses so that students do not have to wait a full year before completing a course of which only a portion was failed. Lack of resources can be catered for by offering courses when lecturers are available, (given the skills shortage mainly due to the poor salaries offered to lecturers). Restrictions on lecture room space can be coped with by offering duplicate courses. This type of flexibility is particularly difficult to manage on the system of the second HEI, where such flexibility is quoted as being not possible on the system, and where even patent errors in the course structure have to go through a long drawn out process of committee approval. The ability to appoint “buy-in” or contract lecturers is poorly supported by the HR processes that are notoriously slow, and these systems appear to be Cinderella systems.

## 8.4 The model: a reflection

The model constructed to portray antecedent factors for successful support is depicted in Figure 8-1.

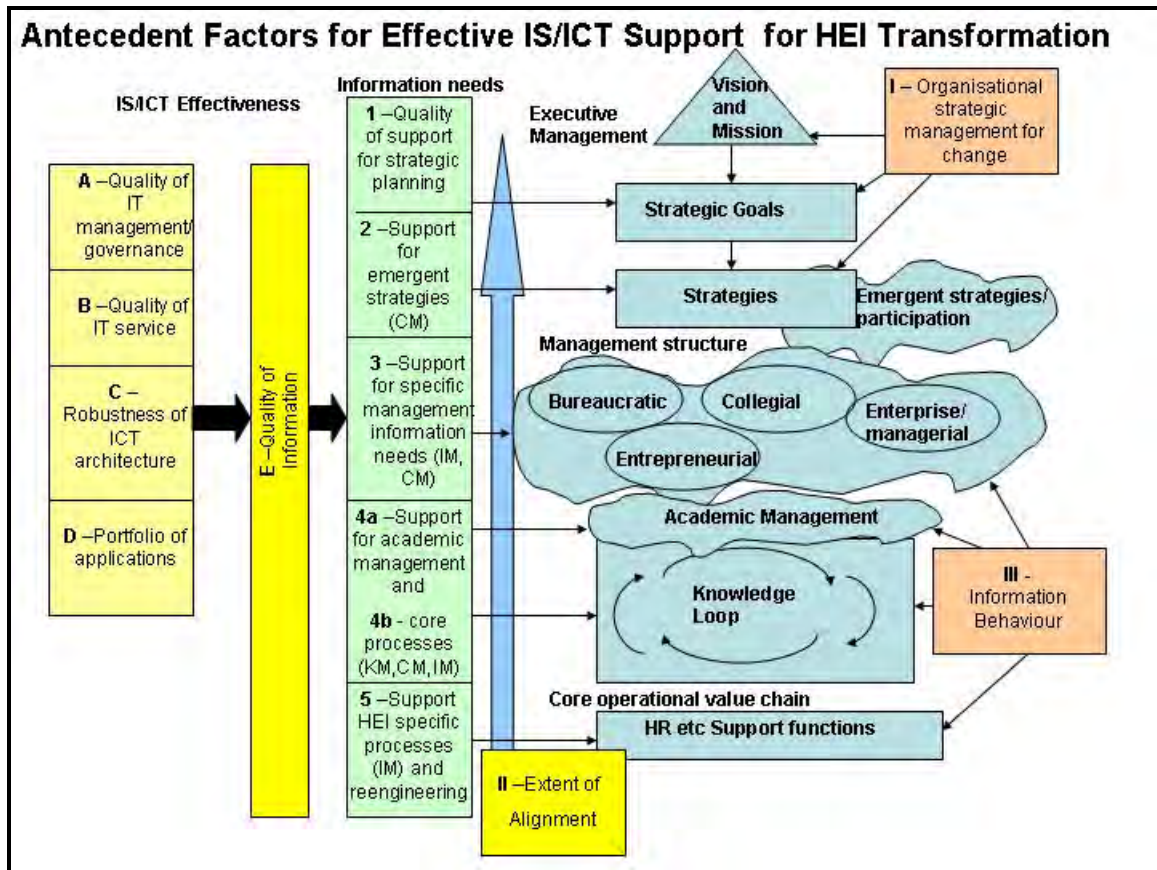


Figure 8-1 Analysis Model/Framework: IS/ICT, HEIs and Transformation - Model proposed from the literature

Following consideration of input from the case studies, an adapted model can be found in Figure 8-2.

In Figure 8-2, antecedent constructs and factors for successful support of transformation have been colour coded to indicate the status at the three case studies discussed, which

may be an indication for extrapolation to HEIs in South Africa. The areas that need specific support are shown in red, drawing on published research and the surveys conducted. These would be factors impeding alignment for transformation. Areas shown in orange are areas that require attention, but are to some extent being addressed. Factors in shades of green are generally well functioning areas, and this may be extended to apply to HEIs in South Africa, given the limitation of generalising from three individual case studies.

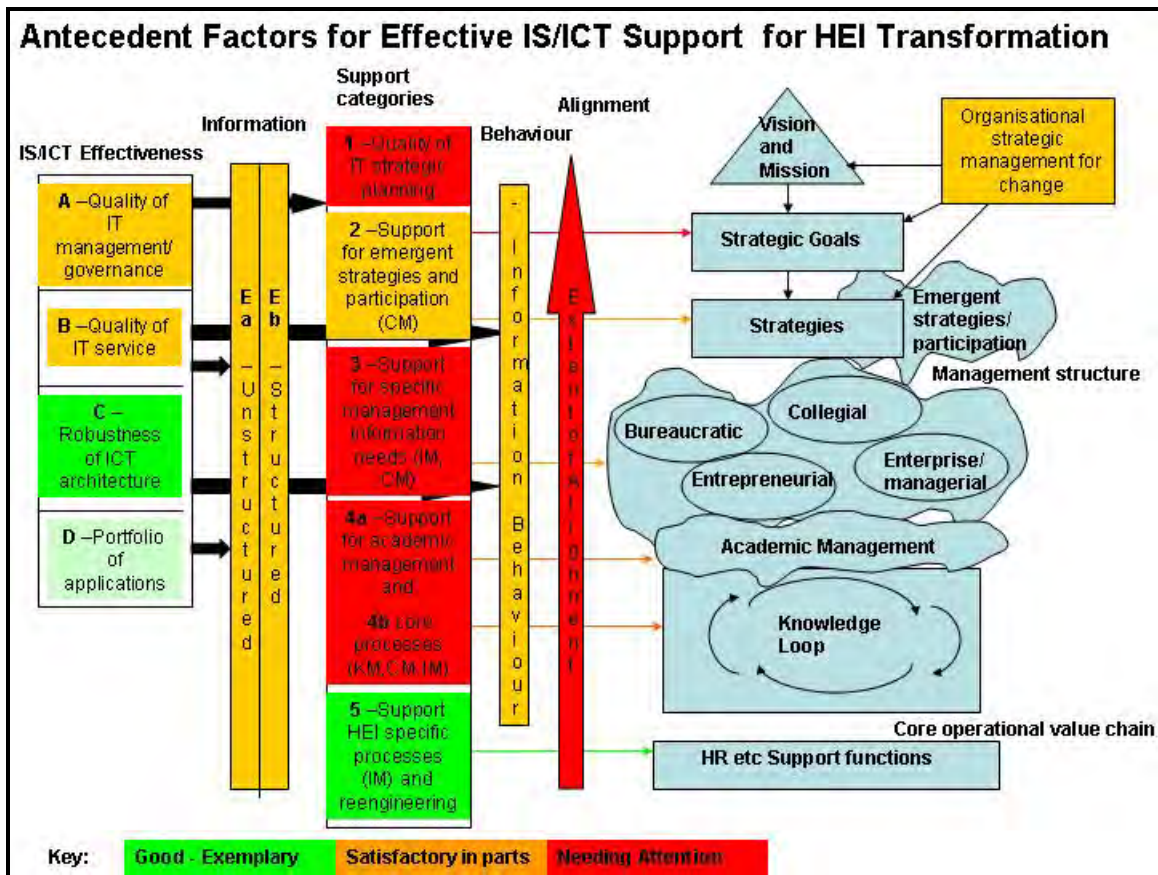


Figure 8-2 Potential for supporting transforming HEIs

On examining the model from left to right, the factors for “IS/ICT Effectiveness” in HEIs do not differ from that for other organisations, and are not specifically related to

transformation although it could be argued that the effectiveness is more crucial in times of change.

The diagram has been changed with the addition of block arrows to indicate that a successful responsive IS/ICT function embraces more than the provision of quality information only, but also requires quality services. The arrows indicate the services offered by the function such as hardware support and helpdesk support.

Regarding “Information”, the type of information provided or supported has also been widened to include unstructured information. This has arguably been an area where IS/ICT has not taken as much responsibility. The thesis argues that in HEIs in a state of transformation, this is an area that requires greater attention.

The “Support Categories” have been divided into areas as per the management and operation layers and their informational support needs. In this categorisation, IS/ICT support for organisational goals as well as IS/ICT support for strategic planning is indicated. Here, the need for support for academic management (category 4) has been emphasised.

The support for “Emergent strategising” (category 2) has been widened to incorporate support for a feedback loop for the organisation. This feedback loop is essential for sensitising to internal emergent behaviour, but equally important is the sensing and detecting of changes in the environment that may require change behaviour, and this would be both for IS/ICT leadership as well as organisational leadership. Partnerships perhaps facilitated by electronic communications with external partners are important as part of this environmental scanning.

The construct – “Information Behaviour” - has been inserted as a factor that influences the exploitation of information provided by electronic media. It is argued that the potential to exploit technology fully is an important construct, given the nature of the different managerial styles of HEIs. The block arrows inserted indicate the support required for this construct by IS/ICT.

The model is useful as a static picture of IS/ICT interaction to allow alignment with organisational management at all levels. It does not depict the feedback loops that would exist, and could be assisted by IS/ICT, as a complex adaptive organism.

## **8.5 *Suggestions for potential use in supporting transforming HEIs***

### **8.5.1 Leadership**

Unified leadership is vital to be able to exploit the strategic possibilities of evolving technology. The fact that ICT, IS, KM and CM are split makes it very difficult to produce this leadership. Innovative use of IS/ICT is apparent, but with visionary leadership at the right level in the HEI, more can be done.

Effective SIPM would be to the advantage of the institution under unified leadership, where the different facets are strategically managed.

### **8.5.2 Strategic planning support: feedback loops**

In terms of complexity theory, an organisation is seen as a self-adjusting organism which uses detectors to detect information as part of the feedback loop to allow adjustment. IS/ICT is a means of doing this through external information detection, firstly and obviously for Internet searching, but also via portal based software that can tailor information feeds according to personal profiles and requirements.

Internally, IS/ICT can act as detectors of how well or badly strategic implementation is progressing. Transparency and accessibility of such information is vital. This type of monitoring is, of course, essential regarding the finances of the HEI, and seems to be used efficiently in this respect (except perhaps for third stream income), but this type of information is lacking for academic management.

### **8.5.3 Management support: information flow**

Committee decision-making is slow. This style of decision-making is unlikely to disappear as it is traditional and has elements of democracy and transparency. However, even the latter features are not exploited if the decision-making and decisions are not efficiently nor effectively disseminated. IS/ICT should be used to store this information electronically, and make it searchable. One of the HEIs in the case studies has demonstrated an example of the possibility of doing so.

### **8.5.4 Management of KM and CM**

Publishing of policies and procedures, capturing administrative employees' knowledge of best practice, capturing IP information, are all examples of KM practice supported by IS/ICT that could benefit especially functional unit management.

It has been said that departments and sub-units often have conflicting goals, even conflicting with the parent HEI's goals. This may be partially attributed to a lack of information where departments may not be aware of what others are doing. CM supported by IS/ICT has a role to play here, but there is a need to manage attendant information overload in innovative ways. Multiculturalism can be better exploited by the intranet, through the use of different (pertinent) languages and the support for collaboration.

The same applies to an organisational culture. A common set of values can be "work-shopped" in institutions that have a diverse population, but unless this is made visible it may be ignored by the staff. CM supported by IS/IC has the means to make actions visible that comply or contradict these values. For example, if there are inefficiencies in processes, and the value subscribed to is excellence, criticisms should be openly communicated and openly dealt with. IS/ICT support for anonymity, if this is desired, is easily achieved.

IS/ICT supported anonymity has to be carefully managed, but has the added advantage of being culturally, racially blind, and thus allows the minimising of racial stereotyping –

the knee-jerk reaction of SA at present. Discussion groups that are moderated are a good example of this type of communication, and are not used widely enough.

### **8.5.5 Core value chain support**

IS/ICT support for the core activities of teaching are being explored vigorously. At present, the electronic capturing for course material appears to be not happening widely enough. This is important especially in areas where there is high staff turnover.

The cultural diversity of students and their learning styles need to be supported better, especially in South Africa where the diversity is large.

Hardware and software support for venues needs to be managed.

Especially for the poorer students, textbooks are hugely expensive, and ways of making such books available electronically should be lobbied for. This has ramifications for access. Where course material has been made available to students, students have rushed to print these as replacements for text books and note taking. This is educationally not ideal, but also causes a secondary problem for the supply of printers.

Research support is good (in terms of electronic library services) and this appears to be general, and the Internet increases collaboration for the few academics in South Africa, but more can be done regarding research dissemination internally and externally.

Interactive searching on internally produced research that is either published or work in progress may be available at other HEIs in South Africa, but to what extent is not known. Focused, portal, searching and information for researchers is not available (although the librarians in general are doing excellent work). This could be automated more.

Community projects may be part of the value chain. The issues mentioned about communications to prevent units competing also hold here.

### **8.5.6 Functional process support**

IS support for the areas where HEI functions are different to other “normal” organisations, should be supported. The student administration function is, of course, a

prime example, but other areas are HR, management of donor funding, and support for student societies.

### **8.5.7 Infrastructure**

Robustness of the technical infrastructure is of critical importance. The technical infrastructure, on the basis of the three case studies, is arguably good at HEIs. However, the costs are high given exchange rates and import duties, and the provision of open and dedicated laboratories with a three year rollout as the ideal, is also expensive. Given the lack of funding plaguing a high percentage of students, the ideal of students all owning personal laptops is still far away.

Problems with the cost of textbooks have been mentioned, but the resources on the web can counteract the expense and difficulties of text, and are a huge source of information for students. However, access to workstations and the lack of bandwidth is a limiting factor. Bandwidth for Universities is subsidised, but more is required (as well as careful bandwidth management). Thin client workstations, and minimal software - Internet access, mail, word-processing and limited functionality spreadsheets, are the main software requirement for students and state-of-the art workstations in open laboratories is unnecessary at present (although a roll-down plan exists at one of the institutions). More access points with less functionality is preferable, except where functionality is specifically required.

Service quality can be improved cost effectively by making use of learnerships for students who can then add to the pool of IT service personnel. This requires management, as it means mentoring, which has a high time- and management-cost, and constant turnover as students leave, but has the benefit of income for the institution and the students, learning for students, as well as wider support coverage through student flexibility.



### **8.5.8 South African specifics**

The three institutions examined lag behind HEIs in the USA, and perhaps those of the developed world, in several respects. One of these is in the provision of student and staff portals. A report by Yanosky, Harris and Zastrocky (2004) states that administrative systems in HEIs in the USA are now much more “technologically mature” and so less prominent in the “Hype cycle” for HEIs and “web self-service...has largely been accomplished”. This is not the case in the HEIs examined. They also state that “basic course management systems are ubiquitous”. This is again not the case in South Africa, if the case studies are typical. Wireless LANs are being used widely, and this is also not the case at the institutions examined.

The area where there is a match between their report and the examined HEIs is demonstrated in the comment that HEIs are starting to “grapple with the content creation, distribution and management issues ... of online instructional delivery” although more needs to be done. The other match is in the realisation that CRM systems are necessary to mine the data richness that exists: “few institutions can assemble a single, coherent view of every constituent”.

Other comments:

- The skills shortage may be greater in South Africa than in the UK or the USA (for example).
- The levels of poverty and levels of computer literacy of first-year students is also a differentiating factor.
- Bandwidth, as already mentioned, is a restriction and cost of technology is higher than in the USA or global counterparts: a figure of the order of 100% more expensive than the cheapest options elsewhere for connection costs and call costs (Paterson, 2005).
- Where SA HEIs may lead is in innovative use of technology.

- Transformation is the nub of this research. As stated, transformation has many different definitions and in South Africa the issue of redress is at the forefront. While it is true that efficiency and effectiveness can be improved through the use of IS/ICT, this may not affect transformation. For example, at the simplest level, IS/ICT can be used to keep track of attempts at redress – number of students in foundation programmes, their success rate, and so forth. However, more importantly, IS/ICT is a powerful tool to support or mask cultural differences in terms of communication management as well as knowledge management, to a lesser degree. Allowing different forms of communication between students, staff and administration, and allowing the communication mode to support different communication styles can be seen to be transformative. While this may be simply using IS/ICT as a sensitising tool, that could be a small start. Language issues and cultural issues can be highlighted through more communication modes.

## **8.6 *Limitations of the research***

The issue of rigour and generalisability in positivist case study research is based on triangulation. The research used semi-structured interviews, published documentation and scaled down surveys to allow for triangulation. Statistically sound surveys would have given a more reliable comparative (and generalisable) analysis, rather than an indication only, as is the case in this research. The instrument to investigate computer and media literacy was used variably in the three case studies and does not provide a reliable measure.

Some of the scaled down surveys assumed that IS/ICT was under one umbrella, and this was not the case, as became clear as the research progressed.

A contrast between “satellite campus” and main campus views would have been insightful.

The construct “Information Behaviour” could have been examined with more rigour.

## **8.7 Further areas of research**

Questions that arose as part of this research, and which would justify further research, are the following:

- An investigation of how far the factors that have been identified in the case studies are applicable to all SA HEIs would be of interest. In particular, comparisons with all other HEIs in terms of provision of IS/ICT, the service levels offered, strategic planning for IS/ICT and the perceived success could be conducted. This would be useful for establishing benchmarks against which each HEI in SA could measure itself as well as against international measures.
- ERP systems developed for business organisations have in several cases been installed at HEIs. While they are installed in the belief that they embody “best practice”, it is a fact that all, except the ITS<sup>®</sup> system and home-grown systems, are based on best practice in America. This may make them less than ideal since adaptation of ERP systems is not advisable. An investigation of how far the ITS<sup>®</sup> system meets University requirements especially in respect of being flexible and entrepreneurial is also an area needing investigation. The motivation for this is that the software was originally created for Technikons who had standard and rigid requirements.
- The construct of information behaviour requires refinement and then further research to indicate whether this is a greater issue at HEIs than in other organisations in South Africa given the potential users who are arguably (!) more intelligent than the rest of the working population.
- The use of innovative technology such as, for example, mobile technology could be a useful area of research in HEIs. Arguably this is easier in HEIs than business organisations as students are encouraged to be innovative and create prototypes.

- The potential of IS/ICT or IS/ICT facilitated KM/CM to support multiculturalism and cultural value shaping has not been researched widely, and again examples of best practice and innovative use would be useful.
- A comparison of the services offered by Tenet as against the support of the JISC and whether more support could profitably be offered in SA is worth investigation.

## **8.8 Summary**

The research examined the provision of IS/ICT support for HEIs specifically in strategic management in a changing context. The research started by examining whether management techniques could be applied to HEI, and concluded that this was possible, if the techniques were adapted to the HEIs given their different ways of operating to other organisations. It continues by examining specifically the ways in which IS/ICT could support HEIs at the different levels, and concluded that although there were “bread and butter” issues that were slightly different in HEIs, the main need for support in the traditional MIS type data was at academic management levels, followed by support for unstructured information use.

This final diagram highlighted the areas that the author proposes are areas requiring attention by HEIs in SA, given the data from three case studies and mindful that extrapolations are not fully justified for case studies. These are:

- That the quality of planning and the coherence of planning needs to be improved, embracing both Knowledge and Communication planning in order to facilitate structured and unstructured information provision;
- That the needs of academic management for information requires attention, both in terms of what (structured) information is available, as well as access to that information;
- That IS/ICT can support the peculiarities of decision-making and management that exist in HEIs and in so doing make information more focused, transparent and accessible;

- That IS/ICT can be used to support informal communications where changes are causing cultural and value changes, and in so doing ameliorate or help shape a more unified culture;
- That better support is required for, in particular, research knowledge management;
- That the information behaviour of the organisation may need attention in order to ensure the quality of structured data and in order to exploit the possibilities of (somewhat) unstructured electronic communications.

The chapter ends with suggestions where IS/ICT can potentially be used to support HEIs in SA in a changing context, as well as suggesting areas of further research.

## **8.9 Conclusion**

There is no doubt that HEIs are transforming. Even those relatively unscathed by mergers are being subjected to change. The support that IS/ICT can give the HEIs to transform is not necessarily at the overt level. Melding different academic course structures is difficult, but more from an administrative than an IS/ICT perspective. The need to report to Government is also reasonably easily supported by IS/ICT provided the information is correctly entered.

However, IS/ICT support of HEIs has not reached its potential (whether the HEI is in a state of change or not). There is little evidence that IS/ICT is supporting HEIs with their somewhat different decision-making and management styles with better information and more transparent tracking and visibility of decision-making (apart from the use of word processing).

In terms of the changes experienced by HEIs, the issues that are prominent are the larger burden born by academic staff in terms of administration, the increased class sizes, the diversity of students, greater focus on research, and the greater need to be entrepreneurial. In these areas IS/ICT needs to support HEIs better. Firstly, in terms of “normal” transactional/MIS type of information to support academic management. Secondly, in terms of better support at core operational level with support for educational software

and support in lecturing venues, as well as better systems for research support (apart from the excellent service offered by the electronic library resources). Furthermore, the new diversity experienced at HEIs could be supported by less standard information allowing for knowledge sharing, which would also mediate the effects of staff turnover. Cultural shaping could be supported by better communication management made possible through IS/ICT. The need to be entrepreneurial is not well supported by either the laborious processes of HEIs or the rigidity of (some) of the ERP systems although it is suggested that at most HEIs a robust ICT infrastructure exists that allows for flexibility.

The issue of data ownership and integrity has been highlighted as possibly problematic at two of the three institutions. This leads to the consideration of “information behaviour” requiring management.

Lastly, using technology innovatively is not evident, and this may well be as the result of the divided way IS/ICT is managed.

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# **Information Technology support for transformation in Higher Educational Institutions in South Africa**

by

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## **Appendix A Pilot Studies**

### **A.1 Introduction**

This appendix reports firstly on two unpublished surveys that were conducted electronically with IT Directors of HEIs in South Africa in 2003. In addition, it reports on a preliminary survey that was conducted at RU in the form of interviews prior to the formulation of the formal proposal.

### **A.2 IT Directors' Survey**

An electronic survey was conducted with IT Directors and Managers of HEIs in South Africa in order to establish what issues were the most pressing, what the general context was, and what portfolio of systems were being supported. Coincidentally, at the same time, Bosire of the East Cape Technikon conducted a similar survey on strategic issues for HEIs and allowed the author the use of the raw data. The two surveys are described and the results reported.

#### **A.2.1 Roets Survey: Respondents of the survey**

A questionnaire was sent to all IT Directors of HEIs in 2003 and 12 responded. **The response was 4 from historically black universities (HBUs); 4 from historically white universities (HWUs); 3 from historically white technikons (HWT); and 1 from a historically black technikon (HBT).** As this was before the mergers of the HEIs (there were 36 HEI institutions, while after the mergers there were 21 (Department of Education)). This response thus represents 33% of the institutions at the time.

#### **A.2.2 Questionnaire used for the Roets survey**

##### **A.2.2.1 Information Technology and Systems at Higher Educational Institutions: Top 10 issues**

If any of the answers are confidential please note this in the indicated column and these will be used only for aggregations.

<b>Q1. Name of Institution</b>	
Name of Respondent	

Please add clarifying comments at the end of the questionnaire, as well as contact details if

<b>Q2a: Resources</b>			<b>Confidential Y/N?</b>
2.1 How many open laboratories are there in your organisation?		2.2 How many workstations in these?	
2.3 How many specialised laboratories?		2.4 How many work stations in these?	
2.5 How many specialised laboratories in your budget?		2.6 How many specialised laboratories administered by your division?	
2.7. How many office workstations for admin and academic staff?		2.8 How many Library workstations?	
2.9 How many servers administered by IT?		2.91 How many servers administered by departments?	

you wish to receive the aggregated information.

<b>Q2b Strategic Issues What are the top 10 issues (ranked in order of importance) concerning IT and IS for the institution in 2003 and 2004</b>	
1	
2	
3	
4	
5	
6	
7	
8	
9	

<b>Q3 IT Provision</b>			
<b>3.1 What is your IT/IS Annual Budget?</b>		<b>3.2 As a percentage of the Institutional</b>	
3.3 What is Institution's IT/IS total budget?		3.4 As a percentage of the Institutional annual budget?	
3.5 How many students are you serving (contact and distance)?		3.6 How many academic staff?	
3.7 How many administrative staff?		3.8 How many IT personnel are there in your division?	

<b>Q4: Strategic Planning</b>	
4.1 Do you have a formal strategic plan for IT (Y/N)?	
4.2 Alignment with Institutional strategies (Y/N)?	
4.3 If yes, how useful is this, and how was alignment ensured?	

<b>Q5: Application Systems: Have you implemented the following systems?</b>				
	<b>In- House</b>	<b>Package (name)</b>	<b>Open Source (name)</b>	<b>Comments e.g. about to purchase, considering, not considering, mission criticality, etc.</b>
5.1 Financial Management				
5.2 Human Resources				
5.3 Student Records				
5.4 Fund Management				
5.5 Alumni Management				
5.6 Course Management				
5.7 On-line registration				
5.8 Web presence				
5.9 Web Portal				
5.10 ELearning				
5.11 Timetabling				
5.12 Residential system				
5.13 Content management				
5.14 Document management				
5.15 Office products				
5.16 Other (specify)				
5.17 Help desk problem tracking				
5.18 Network monitoring				
5.19 Meal booking system				
5.20 Databases				

### **A.2.3 Responses from Roets Survey**

The responses were captured on a spreadsheet, aggregated and shown in the following tables. In Table A-1 the column “Rank by response” is arrived at by dividing the average rank



obtained for the item by the number of responses, and the items were sorted into ascending order based on this column, as an indication of the importance of the issues.

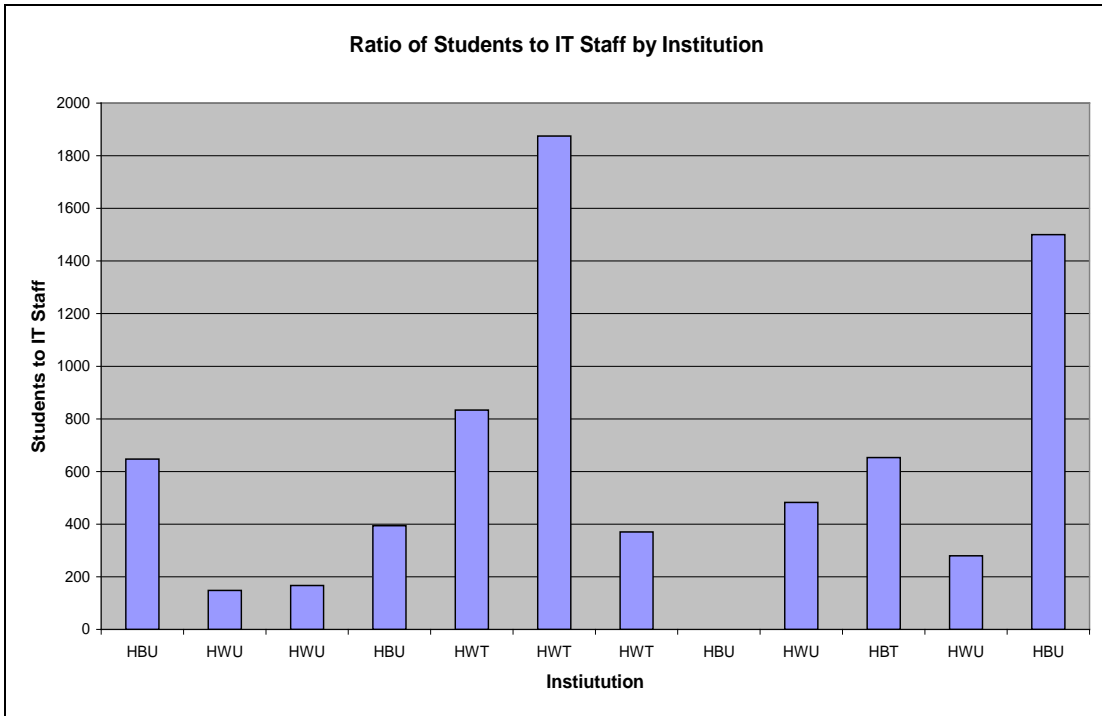
**Q1: Hot Issues**

<b>Q1: In your opinion what are the Hot issues facing HEIs (ranked in importance from 1 to 10 where 1 = "most important")</b>			
<b>Issue</b>	<b>Rank by responses</b>	<b>Average rank</b>	<b>No of Responses</b>
Merger	0.2	1.3	7
Staffing levels and skills, attracting and retention	0.4	3.5	8
Security	0.4	4.8	11
Budget	0.9	5.3	6
ERP	1.0	2.0	2
Admin systems - evaluation of legacy systems	1.0	2.0	2
Staff structures	1.4	5.8	4
Admin systems h/w	1.5	3.0	2
Architecture Decisions	1.5	3.0	2
Skills development	1.6	7.8	5
Network infrastructure	1.8	3.5	2
Strategic Plan	1.8	5.3	3
Business processes	2.1	6.3	3
Document flow	2.1	6.3	3
Pabx – Private Network	2.8	5.5	2
Performance Management	3.0	6.0	2
Bandwidth	4.8	9.5	2

**Table A-1 Hot Issues (2003)**

**Q2: Ratios of resources**

Graphs of the technology provision such as ratios of students to workstations follow per institutional respondent.. The key to the next set of tables are Historically White Univesrities (HWU), Historically Black Universities (HBU), Historically White Technikons (HWT) and Historically Black Technikons (HBT)



**Figure A-1 Students to IT Staff**

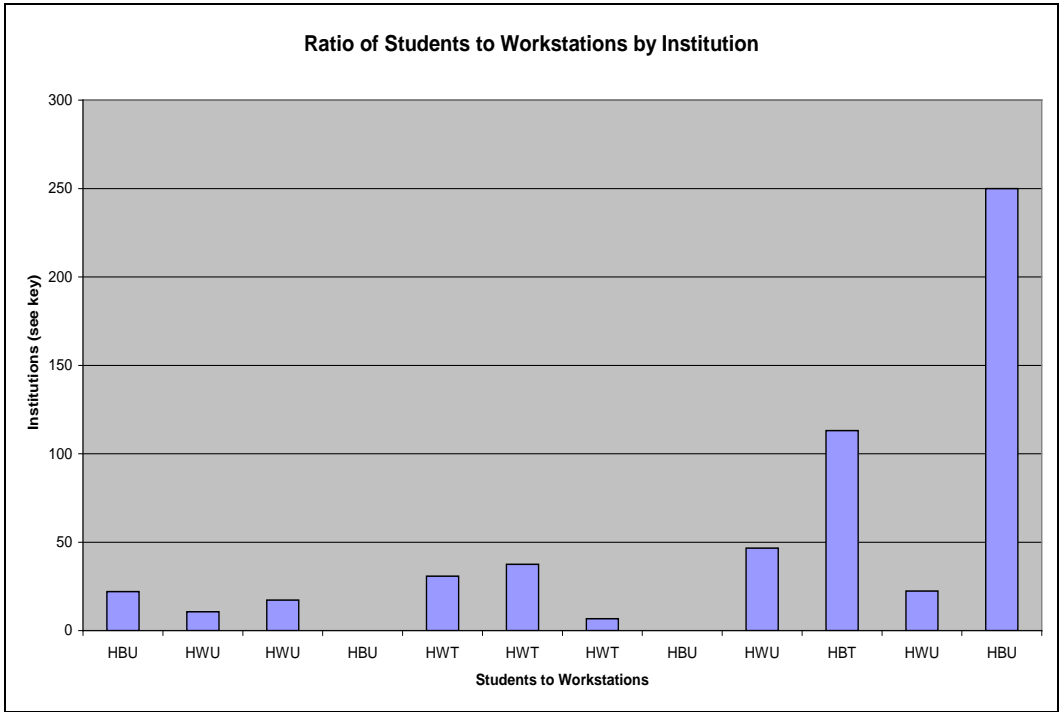


Figure A-2 Students to Workstations

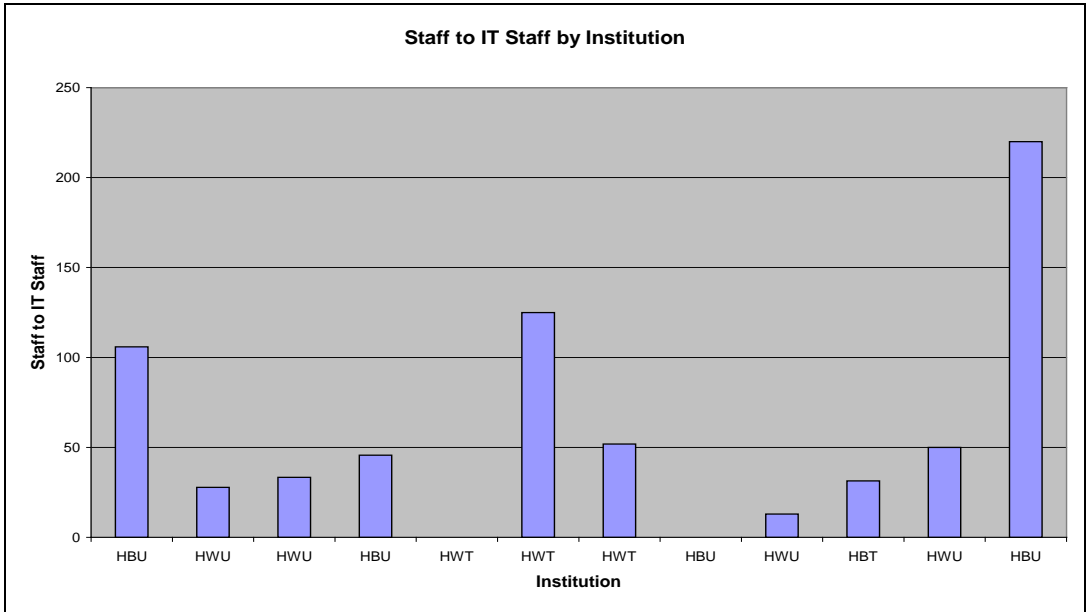


Figure A-3 Staff to IT Staff

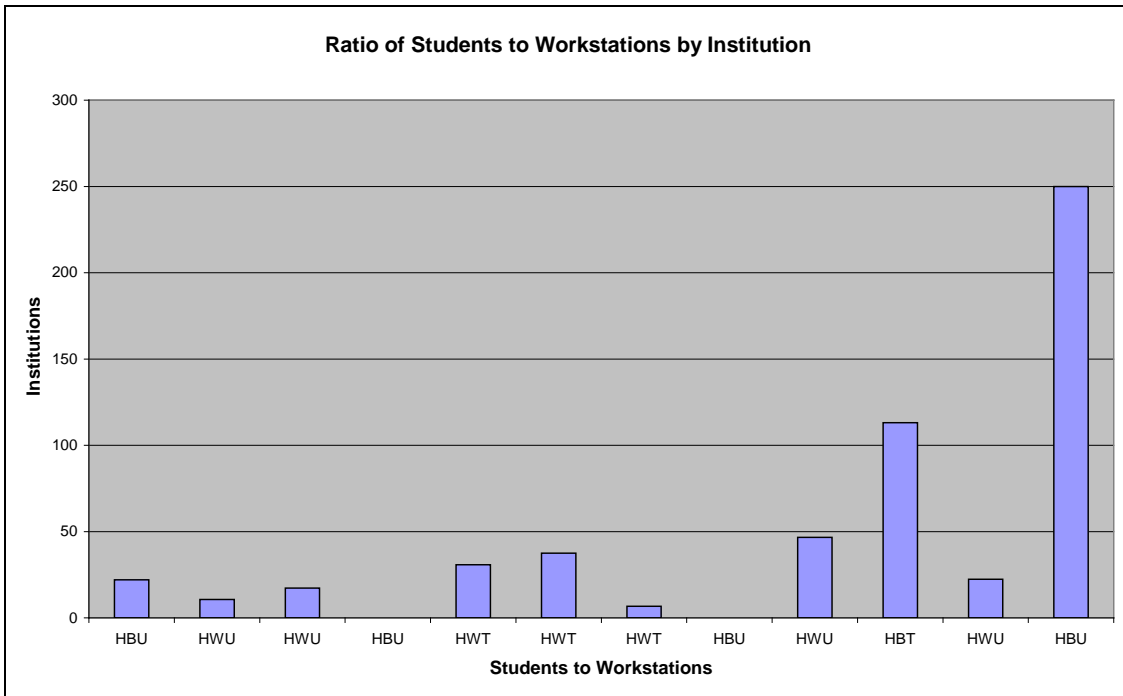


Figure A-4 Workstations to IT Staff

**Q3: Budget**

Q3: Budget – What is the institution’s IT budget?		
Average IT Spend	13.4	(IT Division)*
Average IT Spend as a % of Institution budget	5.20%	Only 4 answers

Table A-2 Budget

\*Several respondents said that this was difficult to estimate because of the way the question was phrased – what was meant exactly: Total IT spend for the University? Capital versus staff and running expenditure? Faculty and departmental budgets?

**Q4: Strategic Planning**

Q4: Strategic Plan	Y/N/no answer
--------------------	---------------

4.1 Do you have a formal strategic plan for IT (Y/N)	7/2/3
4.2 Alignment with Institutional strategies (Y/N)	1/0/11

**Table A-3 Strategic Plan**

## Q5: Portfolio of Systems

<b>Q5: Portfolio - Have you implemented the following systems In-House (IH), Package (Pac), Open Source (OS)?</b>				
5.1 Financial Management	ITS <sup>®</sup>	IHx4	Pacx0	11
5.2 Human Resources	ITS <sup>®</sup>	IHx2	Package - shamblesx2	11
5.3 Student Records	ITS <sup>®</sup>	IHx4	Pacx0	11
5.4 Fund Management	ITS <sup>®</sup>	IHx4	Pacx0	7
5.5 Alumni Management	ITS <sup>®</sup>	IHx6	Pacx0	11
5.6 Course Management	ITS <sup>®</sup>	IHx3	Pac x1	8
5.7 On-line registration	ITS <sup>®</sup>	IHx3	Pacx1	7
5.8 Web presence	ITS <sup>®</sup>	IHx3	Pac x1	6
5.9 Web Portal	ITS <sup>®</sup>	IHx2	Pacx2	4
5.10 ELearning	ITS <sup>®</sup>	IHx3	Pacx5	8
5.11 Timetabling	ITS <sup>®</sup>	IHx4	Pacx1	8
5.12 Residential system	ITS <sup>®</sup>	IHx4	Pacx0	10
5.13 Content management	ITS <sup>®</sup>	IHx1	Pacx2	3
5.14 Document management	ITS <sup>®</sup>	IHx1	Pacx1	2
5.15 Office products	MSx10	MS		MS10
5.16 Other (specify)		IH		
5.17 Help desk problem tracking			OS - request tracking	
5.18 Network monitoring			OS-bb	
5.19 Meal booking system		IHx1	IH	
5.20 Databases	Adabas <sup>®</sup> , Oracle <sup>®</sup> /MySQL/SQLServer <sup>®</sup> MSQL, Oracle <sup>®</sup> , M+SQL, Postgress <sup>®</sup> ,			

**Table A-4 Portfolio**

### **A.3 *IT Director Survey (Bosire)***

#### **A.3.1 Respondents for Bosire's Survey**

This questionnaire was directed at the IT Directors of the HEIs in South Africa, prior to mergers (2003). 14 responses were received to this questionnaire which was > 33% of the targeted population.

The summarised responses are shown in the following tables. The same rating response calculation was done as for the first set of questionnaires.

### A.3.2 Questionnaires and Responses of Bosire’s Survey

#### Q1: CSFs

<b>Q1: CSFs - What are the top three critical success factors for your institution?</b>	
Issues	Rating /
Cost/benefit	0.4
Top management buy-in	0.4
Knowledgeable reliable staff - to make you independent of industry standards?	0.6
Managing scarce resource – budget	0.7
Governance	1.0
Standardisation of products	1.0
Knowledge of people	1.0
Student have excellent services	1.0
Reliability	1.0
Alignment of IT and HEI strategies	2.0
Change management	2.0
Resource sharing	2.0
E-learning strategy	2.0
Staff training	2.0
Good Planning	2.0
Policies and procedures	2.0
Staff teaching support	2.0
Create skilled user base	2.0
Sharing skills knowledge	2.0
Respond to changing business needs	3.0
Scalability	3.0
Best of breed practice	3.0
ERP selection	3.0
Proactive merger negotiations	4.0
Optimum uptime	4.0

**Table A-5 CSFs**



## Q2: Challenges

<b>Q2: Challenges - What are the top three challenges?</b>	
<b>Issues</b>	<b>Rating / responses</b>
Funding - budget - affordability of IT	0.2
Staff - attraction and retention	0.3
Scarce resources	1.0
Generating additional revenue	1.0
Portal	1.0
Staff diversity management	1.0
Competitive salaries	1.0
ERP	2.0
Staff training	2.0
ICT Skills shortage	2.0
Merger management	2.0
Getting management buy-in	2.0
Obsolescence	2.0
Student facilities	3.0
Managing customer expectations	3.0
Oracle project	3.0
Meeting growing IT needs of community	3.0
Skills development	4.0

**Table A-6 Challenges**

### Q3: Opportunities

Opportunities that are created by the changing circumstances were examined:

<b>Q3: What opportunities do you see for IS/ICT?</b>
Challenging work for IT staff
Collaboration between institutions
Sharing resources with other institutions

**Table A-7 Opportunities**

### Q4: Critical Services

The next question examined vital IS/ICT services:

<b>Q4: What services are mission critical?</b>	<b>Rating /</b>
Email	0.6
Internet	0.7
Teaching and research support - lab availability	0.8
Student administration	0.8
Networking – reliability	0.8
Change management	1.0
Data backup and recovery	1.0
Security	1.0
Administrative systems	1.0
Registration	1.0
Support of all students	2.0
Human resources	2.0
Examinations	2.0
Technology to prepare students for real world	2.0
Policies for competitive enhancement	2.0
eLearning	2.0
Helpdesk support and problem tracking	2.0
Web development	2.0
ERP	2.0
File and Print	2.0
Student computing	3.0
Data ownership	3.0

Application integration	3.0
Bandwidth management	3.0
Application development	4.0
Internet availability	5.0

**Table A-8 Mission Critical**

### **A.3.3 Summary**

Many of the issues overlap in the two surveys. The following issues appear in both surveys as the top three of four critical, “hot” or top challenges (in no particular order): mergers (understandably given the time of the survey), staffing levels (attraction and retention) and skills, security, budgetary and resource issues as well as affordability of IS/ICT, and top management buy-in.

## **A.4 Initial pilot study – semi-structured interviews**

A preliminary survey was conducted through interviews of staff on the about-to-be incorporated campus of RU in East London in October 2003 to examine issues of transformation and information provision and usage at HEIs in South Africa and the link between them. The questions used to guide the semi-structured interviews are shown in Table A-9.

A series of interviews was conducted as a pilot project for the survey to be conducted later. The hypothesis that the researcher started out with was that a major aspect of transformation at HEI's was empowerment through more devolution of decision-making, that decision-making was hampered by a lack of information, that this was exacerbated by the information systems supporting the delivery of information, and that transformation at universities could thus be supported by more focused information systems.

The term transformation was explored in these interviews as well as the provision of information. Three academic staff members at senior lecturer, at HoD and Dean level, and three administrative staff members from middle to senior management level were interviewed. Four of these were female, and two were African.

### **A.4.1 Questions asked**

<b>Q1</b>	<b>Hot Issues</b>
	Name:
	Position:
1	What are your main responsibilities and functions in the position?
2	What information are you not able to get that would aid your decision making and why?
3	What is the result of this gap in information on your role?
4	What information do you have easy access to aid in decision making and why is it readily available?
5	What effect does this have on your role?

6	Do your decisions lead to effective action, and if not, why not?
7	How does your gender, race, cultural background, previous experience, etc., affect your decision making and effectiveness in your role? (What helps and what does not)?
8	If not already specified above, how do the institutional information systems aid your access to information?
9	If not already specified above, how do the institutional information systems limit in your decision making?
10	Have you circumvented the deficiencies if any exist in any way, and if so, how? E.g. using personal spreadsheets etc.
11	How useful are the different forms of communication and what are the drawbacks or advantages of each?
12	Are there key people without whom the system would not work, who are they and what roles do they play? Do they fill the gaps of systems that are not working?
13	Which information system areas are most functional in your institution?
14	Which information systems are most dysfunctional in your institution?
15	How, in your opinion, are important decisions made both theoretically and actually in the institution as it affects you in your role?
16	What does the term “Transformation” mean to you?
17	What should the term “Transformation” mean to the institution?
18	What effect could/should information systems have on this transformation? How could information, and information systems aid in transformation, both institutionally and for your role?
19	Other Comments

**Table A-9 Semi-structured Interviews**

## **A.4.2 Response summary**

The answers were summarised under headings and are captured below.

### ***A.4.2.1 Transformation – what does the term mean to you?***

The main answer was that transformation was a response to the new political dispensation, with a more conscious reflection of the demography of the country in terms of both students and staff alignment of staffing structures with equity requirements (seen as “social justice” by one academic).

Changing the demography of students through greater access would imply provision of more funding from Government and other sources.

Other expansions on this “bare” definition of transformation were given:

- a. There needs to be an emphasis on accountability and transparency;
- b. Greater participation by all stakeholders in decision-making;
- c. The curriculum content should be more African - a curricular move towards Africanisation and a focus on the African Renaissance;
- c. The language of instruction should be both Xhosa and English;
- d. The university should respond to its location.

It was also stated that previously disadvantaged staff (by race or gender) had been blocked from promotion through a lack of opportunities.

### ***A.4.2.2 Structures and decision-making***

Reporting structures were complex. There were very confused reporting lines so decision-making was hampered.

The committee system allowed for participation in decision-making, and for checks and balances. Decision-making was open in theory, but not in actuality. The university gave people responsibility without authority.

Despite the committee structures, the normal decision-making structures could be circumvented. Important decisions were sometimes made by the top management without going through these structures. The university was increasingly being managed by the senior executive. The effect of this was seen to be “disconnecting” people lower down and disempowering them. People were now more aware of their powerlessness.

The university was very accountable to students (transparent), but less so to staff.

Two opposing opinions were voiced:

There is an entrepreneurial aspect to the campus, with some ad-hoc decisions made.

Decision-making was often too bureaucratic.

#### **A.4.2.3        *Information availability and decision making***

Academic staff had varying opinions on this:

At the Associate Dean/HOD level, it was stated that it took too long to get important information.

Some information was blocked, for example what had been spent on tutoring, the success of applications for new posts was not made available and confidential referees’ reports were, for example, withheld from individuals on selection committees. This resulted in sub-optimal decision-making.

Information did not always reach the right recipients because of malfunctioning processes, for example, there was a breakdown between decisions made at Senate level and with these being communicated to the administrative functions to action these. Some decisions made in committees were not clearly documented or communicated. Some of the reasons for committee decisions were not fully documented, for example promotion refusals and access and this could prove problematic for the university. One of the administrative staff members felt that there was not enough feedback on the decisions made. Parallel decision-making existed with documents bouncing backwards and forwards between committees. As with all committee work, some information is kept secret or within committee to protect

members. Off the record comments, for example, are normal as is the fact that not all reasons for decisions are documented and minutes can reflect the chair's biases.

Some information could be obtained only by using individuals and networks. The availability of information in a timely manner was essential for functioning effectively. The need to rely on people to get information was mentioned as a problem by administrative staff. Another administrative staff member reiterated the issue of a lack of timely information and the lack of reporting structures that hampered information flow.

Academics particularly mentioned an overload of information. A large number of repetitive documents bounced between committees. Information was often ignored because of the overload, or the information was not trusted, or people were disengaged from the aims of the organisation. An example of the latter was that people ignored academic development exhortations.

#### ***A.4.2.4 Information Systems***

Information appeared to exist but was only obtainable by requesting this from the IT staff. User IT skills were seen as too low to use the systems properly. The system did not support all requirements as departmental budgets were still run in parallel. Of all systems, email was viewed as the most important. This opinion was repeated by most of the people interviewed. An email overload was mentioned. One administrative staff member felt that the financial systems were accurate and up-to-date and dependable and gave all the information required for decision-making in that (financial) respect.



## **Appendix B Protocol and Questionnaires**

### ***B.1 Interview Protocol***

The interview protocol is divided up into sections<sup>1</sup>.

#### **B.1.1 Introduction**

- Thank interviewers for their time and confirm identity and the level of anonymity required. If the interview is being recorded, check that the interviewee is happy with this and state that a transcribed version of the interview will be sent to him/her for comment or change. Ensure recording of email addresses and other contact details.
- State the purpose of the interview: to assess the support obtained from IS/ICT for their specific purposes. Explain that although eLearning is important, it is not the main focus of this research.
- Check whether the questionnaire(s) have been completed, and if not, work through it with the respondent, explaining the purpose of the questionnaires. Slot the questionnaires into the categories below and for each questionnaire, ask for general comments. For all questionnaires, ensure that the position of the respondent (student, academic, senior academic - HoD, Dean, senior lecturers, top management – V-C, V-P, Executive Management, administration, senior administration - Directors) is noted. Also ensure that each one has either a number to anonymously identify the questionnaire or a name, unless special anonymity is requested, as the questionnaire pack will be split up into separate questionnaires for capturing.

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<sup>1</sup> The interview protocol was used by both the author and student helpers.

The questionnaires in these sections are referred to by a heading number preceded by a Q (e.g. Q2.1.1) as identified on the survey forms.

### **B.1.2 Invite general context remarks**

(These questions are mainly directed at top management and IT management).

- University strategic thrust – what is the vision, mission and strategic objectives (Q1.1 can be used to give guidance or as a questionnaire). How successful is the University in pursuing these? How is strategic planning done and how frequently?
- What is the dominant management style of the University? What is the culture of the University?
- Are staff aware of the strategic objectives of the University - does IT support these?
- Are top management informed about student and junior staff issues? What is the information flow between top management and students or new staff?
- How transparent are decisions made by top management to junior staff and students?
- What is understood by KM? How much exists in the University? Q4.1 can be slotted in here as well as Q4.2 (a stripped-down version of KMAT). These elicit the knowledge management practices as supported by IS/ICT.

### **B.1.3 Transformation**

(Senior staff mainly)

- Ask what the respondent understands by transformation and how is the University shaping up to its stated goals?
- What does the respondent view as the role of IS/ICT in transformation?

### **B.1.4 Three campuses – incorporation**

(Questions for Senior staff, mainly)

Ask what the experiences are with new campuses? Has IS/ICT a role in the incorporation?  
What have been the information impacts?

### **B.1.5 IS/ICT context**

(These questions are mainly directed at IT Management, but user perceptions are also sought from all participants)

- How important is IT for the University? Ask the respondent to explain the answer preferably by means of examples.
- IT/IS structure - how important is IT to the University?
- What performance management systems are in place and if any are these supported by IS/ICT?
- What is the respondent's experience of IT at the University – reliability of systems, quality of information?
- What particular frustrations exist?
- Try to obtain the ratios of computer equipment especially of workstations in open and specialist laboratories to students, staff and support. What are perceived as the main challenges in technology provision? Are students charged separately for IT usage? (Ask for details). Budget as a ratio of organisational budget should be asked for.

### **B.1.6 Overall alignment**

Slot in Q1.2 (Alignment Maturity) for senior respondents.

### **B.1.7 IS/ICT - Strategic**

(These questions are mainly directed at IT Management, but user perceptions are also sought from all participants)

- What is the IT budget as a percentage of the organisational budget?
- Is the respondent aware of whether SIPM, vision, mission exists. What is the planning cycle? What aspects are considered - Hardware Technology; Information, Information Systems, Knowledge and Communication can be mentioned as prompts.

- How successful is IS/ICT in supporting organisational strategies? (Obtain respondent's perception). Is the CIO/IT Director involved in strategic planning for the organisation?
- What is understood by KM? How much exists in the University? Q4.1 can be slotted in here as well as Q4.2 (a stripped-down version of KMAT). These elicit the knowledge management practices as supported by IS/ICT.

### **B.1.8 IT Support for Tactical level**

(Questions for senior administrators such as: Registrar, HR Director)

What percentage of information would they get from the enterprise system, their own systems, other people or other resources if they were to do an annual budget?

(Questions for Senior staff mainly)

Universities are perhaps different with respect to decision-making since committee decision making is so slow. Ask for comment on this statement, and then ask whether IT supports decision-making and perhaps speeds its up.

### **B.1.9 IT Support for Operational level**

(These questions are mainly directed at Academics and Students but perceptions may also be sought from all participants)

Do staff/students get the information they require from the systems to perform their functions? Use Q2.4 (EUCS) to corroborate the user-friendliness of the enterprise system.

(Questions for Deans and HoDs)

For the following respondents - Deans and HoDs: ask what percentage of information they would get from the enterprise system, their own systems, other people or other resources if they were to do an annual budget.

(Questions for HoDs and Lecturers)

Ask where they find information regarding an average of a class mark for a particular class; if they need a comparison between course results, say Economics2 and Information Systems2 for the June exam marks, where is this obtained?

(Questions for Student respondents)

Does IS/ICT support their needs academically, for societies, socially? If they need their student record, where/how do they get this? If they need to pay for printing, for example, how/where do they do this? Is registration automated?

(Questions for all levels)

Elicit any opinions and comments re Teaching and Teaching equipment/ Research.

Do students and junior staff have information regarding top management decisions? What is the information flow between top management and students or new staff? How transparent are decisions made by top management to junior staff and students?

### **B.1.10 IT support for Functional units' information needs**

(Questions for Administrators)

How satisfied is the respondent with the systems to support his/her needs? Use Q2.3 (EUCS) to support this discussion.

### **B.1.11 IT Management and Governance**

(Questions for IT Management)

Ask questions regarding governance: What policies exist? Do steering committees exist? Are Project Plans in place?

Elicit comments regarding staffing.

- What feedback/management practices are in place (e.g. tracking of queries, Balanced Scorecard, Project Management)?
- Who does the IT director report to? Ask, and indicate, if other IT Managers report differently. Who is in charge of information management, communication management, KM?
- Does a charge-out policy exist?

### **B.1.12 IT Service quality**

(Questions for all respondents)

How successful is IS/ICT in supporting the processes of the organisation? (Obtain respondent's perception). Slot in Q2.4 (Servqual).

### **B.1.13 IT Robustness**

(Questions for all respondents)

Ask widely what the perception is of robustness of systems. Ask IT management regarding disaster recovery policies and backups.

### **B.1.14 IS Completeness**

(Questions for IT Management)

What systems exist to support processes? Use Q2.1 (PORTFOLIO) as a checklist.

### **B.1.15 Information Quality**

(Questions for students and all levels of Academic and Administrative staff)

If systems are in place, do they provide for quality information?

### **B.1.16 Information Behaviour**

(Questions for students and all levels of Academic and Administrative staff)

Q3.1, Q3.2, Q3.3, and Q3.4 are used to estimate the computer/media usage readiness and support for communications, and should be used next.

### **B.1.17 General comments, possibilities and criticism**

(Questions for Senior staff mainly, as well as IT management)

Is the respondent aware of any unique strategies that are being instituted?

How much leadership is shown by IT directorate in leading into new technologies? Ask for expansion and examples if possible.

What are the particular success stories and challenges (focusing on IT)?

## **B.2 Questionnaires**

### **B.2.1 Strategic Objectives (Q1.1)**

Ask the respondent what the main strategic objectives are of the University (the list below indicates some commonly mentioned if prompting is needed). The list has a rating scale of 1 to 5 (where 1 = least important and 5 = most important or most successful). Add in others and then ask for the strategies in place to realise these, and if possible, ask them to rate the success of the strategies on the same 1-5 scale.

<b>Q1.1 Strategic objectives</b>			
<b>Objectives</b>	<b>Importance</b>	<b>Strategies to realise these</b>	<b>Success</b>
Government Policy			
Research			
Mergers			
Resource squeeze/ Search for			
Employment Equity			
Student Demography			
Open Access			
Throughput rate			
Community Involvement			
Other (add in)			

**Table B-1 Strategic Objectives**

This questionnaire is adopted from Luftman's Alignment Maturity Questionnaire (Luftman, 2000; 2003; Luftman and Brier, 1999; Luftman *et al.*, 1999; Peppard and Ward, 1999; Ward and Peppard, 2002).

The purpose of the questionnaire is to establish an alignment maturity index. An accompanying question could be to ask how closely do IT and top Management understand and support each other.

(Respondents should ideally comprise 1 or 2 IT managers, 3 respondents from top management such as a Dean, a University Planner, CFO, V-P, V-C)

This questionnaire requests a rating from 1 to 5, and shows the responses indicated for each rating.



<b>Q1.2 Alignment Maturity</b>						
<b>Category and Issues</b>						<b>Response</b>
<b>1. Communications</b>						
1.1	Understanding of business by IT					
	1. IT management not aware	2. Limited IT awareness	3. Good understanding by IT management	4. Understanding encouraged among IT staff	5. Understanding required of all IT staff	
1.2	Understanding of IT by business					
	1. Business management lack understanding	2. Limited business awareness	3. Good business awareness	4. Understanding encouraged among staff	5. Understanding required of staff	
1.3	Inter/intra-organisational learning					
	1. Casual, ad-hoc conversation and meeting	2. Newsletters, reports, group email	3. Training, departmental meetings	4. Formal methods sponsored by senior management	5. Learning monitored for effectiveness	
1.4	Style and ease of access					
	1. Business to IT only; formal	2. One-way, somewhat informal	3. Two-way, formal	4. Two-way, somewhat informal	5. Two-way, informal and flexible	
1.5	Knowledge sharing/leveraging intellectual assets					
	1. Ad-hoc	2. Semi-structured sharing emerging	3. Structured around key processes	4. Formal sharing at all levels	5. Extra-enterprise - formal sharing with partners	
1.6	IT staff/business liaison					
	1. None or used only as needed	2. Primary Business IT Link	3. Formalised, regular meetings	4. Bonded, effective at all internal levels	5. Extra-enterprise	

<b>2. Competence/Value metrics</b>						
2.1	IT metrics					
	1. Technical; Not related to business	2. Technical, cost; metrics rarely reviewed	3. Review; act on metrics; ROI	4. Also measure effectiveness	5. Also measure business ops, HR; external partners	
2.2	Business metrics					
	1. IT investment measured rarely if ever	2. Cost/unit; rarely reviewed	3. Review; act on ROI; cost	4. Also measure customer value	5. Balanced scorecard includes partners	
2.3	Link between IT and business metrics					
	1. Value of IT investment rarely measured	2. Business and IT metrics unlinked	3. Business and IT metrics becoming linked	4. Business and IT metrics formally linked and acted upon	5. Balanced scorecard includes partners	
2.4	Service level agreements of IT function					
	1. Sporadically used	2. With units for technology performance	3. Emerging across the enterprise	4. Enterprise wide	5. Extended to external partners	
2.5	Benchmarking					
	1. Seldom or never practiced	2. Sometimes benchmark informally	3. May benchmark formally, seldom track	4. Routinely benchmark, usually act	4. Routinely benchmark, act on and measure results	
2.6	Formal assessment / reviews of IT investments					
	1. None	2. Only when there is a problem	3. Becoming routine	4. Routinely assess and act on findings	5. Routinely assess, act on and measure results	
2.7	Continuous improvement practices					
	1. None	2. Few; effectiveness not measured	3. Few; starting to measure effectiveness	4. Frequently	5. Routinely performed	

<b>3. Governance</b>						
3.1	Formal business strategic planning					
	1. Not done, or done as needed	2. At unit functional level, slight IT input	3. Some IT input and cross-functional planning	4. At unit and enterprise, with IT	5. With IT and partners	
3.2	IT strategic planning					
	1. Not done, or done as needed	2. At unit functional level, slight business input	3. Some business input and cross-functional planning	4. At unit and enterprise, with business	5. With partners	
3.3	Organisational structure					
	1. Centralised or Decentralised	2. Central/Decentralised; Some co-location	3. Central/Decentralised; Some federation	4. Federated	5. Federated	
3.3	Reporting relationships					
	1. CIO reports to CFO	2. CIO reports to CFO	3. CIO reports to COO	4. CIO reports to COO or CEO	5. CIO reports to CEO	
3.4	Budgetary control					
	1. Cost Centre; Erratic spending	2. Cost Centre by functional unit	3. Some projects treated as Investments	4. IT treated as an investment	5. Profit Centre	
3.5	Rationale for IT spending					
	1. Reduce costs	2. Productivity, efficiency focused	3. Process enabler	4. Process driver, strategy enabler	5. Competitive advantage, profits	
3.6	Steering committee					
	1. None	2. Meet informally as needed	3. Formal committees meet regularly	4. Proven to be effective	5. Also includes external partners	

3.7	Prioritisation process					
	1. React to business or IT needs	2. Determined by IT function	3. Determined by business function	4. Mutually determined	5. Partners' priorities considered	

<b>4. Partnership</b>						
4.1	Business perception of IT value					
	1. IT perceived as a cost of business	2. IT emerging as an asset	3. Enables future business activity	4. Drives future business activity	5. Partner with business in creating value	
4.2	Role of IT in strategic business planning					
	1. No involvement	2. Business process enabler	3. Business process driver	4. Business strategy enabler/driver	5. IT Business adapt quickly to change	
4.3	Shared goals, risk, rewards/penalties					
	1. IT takes risk with little reward	2. IT takes most of the risk with little reward	3. IT Business start sharing risks, rewards	4. Risk and rewards always shared	5. Management incentivised to take risks	
4.4	Managing the IT-business relationship					
	1. Relationship not managed	2. Managed on an ad-hoc basis	3. Processes exist but not always followed	4. Processes exist and complied with	5. Processes are continually improved	
4.5	Relationship / trust style					
	1. Conflict and mistrust	2. Primarily transactional	3. Emerging valued service provider	4. Long-term partnership	5. Valued partnership, trusted vendor of IT services	

4.6	Business sponsor/champion					
	1. None	2. Often have a senior IT sponsor	3. IT and business sponsor at unit level	4. Business sponsor at corporate level	5. At the CEO level	

<b>5. Scope and Architecture</b>						
5.1	Primary systems					
	1. Traditional (e.g., accounting, email)	2. Transaction (e.g., ESS, DSS)	3. Expanded scope (e.g., business process enabler)	4. Redefined scope (business process driver)	5. External scope; Business strategy driver/enabler	
5.2	Standards articulation					
	1. None or ad-hoc	2. Standards defined	3. Emerging enterprise standards	4. Enterprise standards	5. Inter-enterprise standards	
Architectural integration:						
5.3	Systems across the organisation					
	1. No formal integration	2. Early attempts at integration	3. Integrated across the organisation	4. Integrated with partners	5. Evolved with partners	
5.4	Architectural transparency, flexibility					
	1. None	2. Limited	3. Focused on communications	4. Effective emerging technology management	5. Across the infrastructure	

<b>6. Skills</b>						
6.1	Innovation, entrepreneurship					
	1. Discouraged	2. Somewhat encouraged at unit level	3. Strongly encouraged at unit level	4. Also at corporate level	5. Also with partners	
6.2	Key IT HR decisions made by					
	1. Top business and IT management at corporate level	2. Same with emerging functional influence	3. Top business and unit managements; IT advises	4. Top business and IT management across firm	5. Top business management across firm and partners	
6.3	Change readiness					
	1. Resistant to change	2. Change readiness program emerging	3. Program in place at functional level	4. Program in place at corporate level	5. Proactive and anticipate change	
6.4	Career crossover					
	1. Job transfers rarely occur	2. Occasionally occur within unit	3. Regularly occur for unit management	4. Regularly occur at all unit levels	5. Also at corporate level	
6.5	Education, cross-training					
	1. No opportunities	2. Decided by units	3. Formal programs run by all units	4. Also across enterprise	5. Also with partners	

6.6	Social, political, trusting environment					
	1. Minimal IT-Business interaction	2. Strictly business only relationship	3. Trust and confidence emerging	4. Trust and confidence achieved	5. Attained with customers and partners	
6.7	Attract and retain top talent					
	1. No retention program; poor recruiting	2. IT hiring focused on technical skills	3. Technology and business focus; retention program	4. Formal program for hiring and retaining	5. Effective program for hiring and retaining	

**Table B-2 Alignment Maturity**

### **B.2.2 System Support (Servqual - Q2.4)**

This questionnaire elicits the views of the service provided by the IT function. It is an established questionnaire (Jiang *et al.*, 2002; Kang and Bradley, 2002; Myerscough, 2002).

The Servqual instrument should be distributed as widely as possible.

This questionnaire needs explanation: the first column is what the ideal or desired service is required, the second, what is possible, given the context of resources, and the third, what the perceived level of actual service is. This allows for a realistic view to be given. The rating scale is 1 to 7, where 1 = Low and 7 = High. N/A can be used to indicate no opinion.

<b>Q2.4 Servqual</b>				
<b>Service Provided</b>		<b>User Category</b>		
		<b>Desired</b>	<b>Possible</b>	<b>Actual</b>
<b>Reliability: Excellent information services will</b>				
1	When promising to do something by a certain time, will do so			
2	Perform the service right the first time			
3	Inform users when request can be completed			
4	Inform users regularly about the status of users' requests			
5	Provide services at the time they promise to do so			
<b>Responsiveness: Excellent information services will</b>				
6	Have operation hours convenient to all their users			
7	Give prompt service to users			
8	Always be willing to help users.			
9	Never be too busy to respond to the users' requests			
<b>Assurance: Employees in excellent information services will</b>				
10	Instil confidence in users by their behaviour			
11	Be consistently courteous with users			
12	Have the knowledge to answer users' questions			
<b>Empathy: Excellent information systems employees will</b>				
13	Give users individual attention			
14	Have employees who give you personal attention			
15	Have the users' best interests at heart			
16	Understand the specific needs of their users.			

**Table B-3 Servqual**



### B.2.3 Systems (Portfolio) (Q2.1)

(Devised by author)

What main administrative/enterprise system is used?

Which of the following are supported by either the enterprise system or other programmes?

(The answers are a tick in the box for “Yes”, “P=Planned for”, or “No”. If possible, elicit whether the “Yes” or “Planned” applies to the ERP or other software systems and if the latter, the name of the software).

<b>Q2.1 Portfolio : Percentage completeness of provision</b>					
	<b>Category of Systems</b>	<b>Yes</b>	<b>P</b>	<b>No</b>	<b>Enterprise</b>
<b>1</b>	<b>Administration needs</b>				
a	Procurement/buying				
b	Fundraising				
c	Financial aid				
d	Track of usage, externally, for claiming funding				
e	Track of usage, internally, for “funny money” budgeting				
f	Student admissions				
g	Student accommodation				
h	Student general record systems				
i	Maintenance				
j	State regulatory statistical systems				
k	Marketing, alumni and PRO systems				
l	Integrated estates management with asset management				
m	Inventory management				

n	Human resource systems including payroll (and how flexible)				
o	Management accounting (where grant management is atypical for business organisations)				
<b>2</b>	<b>Student Services</b>				
a	Email				
b	Electronic Bulletin boards				
c	Word-processing				
d	Database software				
e	Spreadsheet software				
f	Instructional software				
g	Internet access				
h	Programming languages				
i	Laser printing				
j	Data storage and archives				
k	Electronic news service				
l	Computer animation				
m	Simulation				
n	Advanced graphics systems				
o	IT support resources				
p	College book store services				
q	Electronic reserves				
r	Portals				
s	Election organisation for students				
<b>3</b>	<b>Administration services for students</b>				
a	Undergraduate applications				
b	Financial aid applications and status				
c	Course catalogues				

d	Current and potential degree audit				
e	Personal electronic planner and personal web pages.				
f	Course billing				
g	Midterm and final grades				
h	Change majors				
i	Course bookings				
j	Monitor degree progress				
k	Student transcripts				
l	Course registrations				
m	Online credit card use				
n	Online assessment				
o	eCommerce (fee payments)				
p	Meal and parking organisation				
q	Financial aid billing				
r	Portals				
<b>4</b>	<b>Academic needs</b>				
a	Online courses				
b	Instructional software				
c	Course management systems				
d	Research publication management				
e	Timetabling and room booking systems				
f	Faculty and Departmental budgets				
g	Faculty newsletter				
<b>5</b>	<b>Library Services</b>				
a	On-line library catalogues				
b	Encyclopaedias				
c	Dictionaries				
d	Thesauruses				

e	Library card catalogues				
f	Full-text electronic databases				
g	On-line book renewal				
<b>6</b>	<b>IT Management systems &amp; web features and applications</b>				
a	Route maps				
b	Computer help desk support				
c	Central directory				
d	Campus search engine				
e	IT management systems i.e. systems to track usage and other IT management systems				

**Table B-4 Portfolio**

### B.2.4 User friendliness and quality of information - Use of ERP systems (Q2.3)

This questionnaire is derived from the EUCS questionnaire (McHaney *et al.*, 1999).

Respondents should be chosen from all levels.

The rating scale is 1 to 5, where 1 = poor and 5 = excellent. First confirm the type of enterprise system and its name.

<b>Q2.3 Use of Enterprise System (ITS<sup>®</sup> /Protea/....)</b>		
		<b>Category of User</b>
	<b>Issues</b>	<b>Rating</b>
1	Is the system accurate?	
2	Do you get the information you need on time?	
3	Are the services always available?	
4	Does the system provide up-to-date information?	
5	Are you satisfied with accuracy of the system?	
6	Is the system robust?	
7	Does the system provide sufficient information?	
8	Does the information content meet your needs?	
9	Does the system provide reports that seem to be exactly what you need?	
10	Do you think the output is presented in a useful manner?	
11	Does the system provide you with the precise information you need?	
12	Is the information presented clearly?	
13	Is the system easy to use?	
14	Is it easy to get the exact information you need?	
15	Is the system user friendly?	
16	Can you tailor the output to your needs?	

**Table B-5 Enterprise system supporting information needs**

### B.2.5 Information and media literacy and usage (Q3)

Respondents for these questionnaires should be the same as those chosen for the Servqual questionnaire, excluding top management, senior administration, and senior academics. They elicit the users' perceptions of the literacy, usage and responsiveness of the different categories of the University community with respect to technology use for communications. This questionnaire was devised by the author.

### B.2.6 Information Literacy (Q3.1)

The question asked is "How literate in your opinion are the categories of the University community (Admin, Academic, Students) in using the following systems?" The rating scale is 1 to 5, where 1 = poor and 5 = excellent (and which will later be transformed into a percentage out of 5 in aggregated form).

<b>Q3.1 Computer Literacy</b>		
<b>Category</b>	<b>Medium/System</b>	<b>Rating</b>
Admin	Email	
	Word-processing	
	Spreadsheet Use	
	Administration system use	
	Database queries	
	Internal Information seeking on the web	
	External Information seeking on the web	
	Electronic library usage	
Academic	Email	
	Word-processing	
	Spreadsheet Use	
	Administration system use	
	Database queries	
	Internal Information seeking on the web	
	External Information seeking on the web	

	Electronic library usage	
Students	Email	
	Word-processing	
	Spreadsheet Use	
	Administration system use	
	Database queries	
	Internal Information seeking on the web	
	External Information seeking on the web	
	Electronic library usage	

### B.2.7 Media Usage (Q3.2)

The question asked is “What percentage of your work related communication with employee categories within the organisation is based on the various media”? The total should be 100% per respondent for each category.

<b>Q3.2 Media Usage</b>		
<b>Category</b>	<b>Media</b>	<b>Percentage usage</b>
Admin	Email	
	Telephone	
	Cell phone	
	Fax	
	Written communications	
	Personal contact	
	Meetings/ conferences	
	Web	
Academic	Email	
	Telephone	
	Cell phone	
	Fax	

	Written communications	
	Personal contact	
	Meetings/ conferences	
	Web	
Students	Email	
	Telephone	
	Cell phone	
	Fax	
	Written communications	
	Personal contact	
	Meetings/ conferences	
	Web	

### **B.2.8 Media Responsiveness (Q3.3)**

The question to be asked is: “What percentage of response do you get when communicating with the following categories and using the following media?” The rating scale is 1 to 5, where 1 = Very poor, and 5 = Excellent. The responses will be averaged and reported as a percentage out of 5.

<b>Q3.3 Media Responsiveness/ Effectiveness</b>		
<b>Group</b>	<b>Media</b>	<b>Percentage</b>
Admin		
	Email	
	Cell-phone voicemail	
	Written	
Academic	Email	
	Office voicemail	
	Written	



Students	Email	
	Cell phone voicemail	
	Written	

### **B.2.9 Promptness/ Effectiveness (Q3.4)**

The question asked is: “How prompt are the replies on average?”

The scale is 1 to 5 where 1 = Very slow, to 5 = Very prompt. The responses will be averaged and shown as a percentage of the maximum.

<b>Q3.4 Media efficiency/promptness</b>		
	<b>Media</b>	<b>Rating</b>
Admin	Email	
	Cell phone voicemail	
	Written	
Academic	Email	
	Cell phone voicemail	
	Written	
Students	Email	
	Cell phone voicemail	
	Written	

### **B.2.10 Knowledge Management**

Two questionnaires are to be circulated for KM. However, if respondents find the first difficult or time consuming, discard the first (Q4.1), and concentrate on the second (Q4.2).

### **B.2.11 Knowledge Management in Universities (Q4.1)**

This questionnaire was devised by Kouwenhoven to be applied to HEIs (Kouwenhoven, 1999).

The main question is “What Knowledge Management Systems are in place?”, and the answers are “Yes”, “No”, “Planned for”. “D” can be used for “Don’t know” in the first column. If possible indicate whether paper, intranet or individuals are the sources - Paper, Web, Individual (P, W, I) if the answer is “Y” or “P” in the second column. Main respondents targeted: Top management, senior administrators in support units, and senior academics.

<b>Q4.1 Assessment of Knowledge Management Practices at Universities</b>			
	<b>Practice</b>	<b>Y, P, N, D</b>	<b>P,W,I</b>
<b>1</b>	<b>Availability of knowledge</b>		
a i	Formal static - vision, mission		
a ii	Formal mostly repetitive searchable information such as digest, calendar, reports		
a iii	Minutes of e.g. Faculty, Senate and Sub-committees, Council		
b	Less formal in terms of statistics, trends and other MIS type knowledge and information		
c	Policies, regulations		
<b>2</b>	<b>Types of information</b>		
a	Publishing staff knowledge base ( skills database ) and research knowledge base (published, WIP and IP) on intra or Internet		
b	Casual news		
c	Availability of know-how to access, use and interpret information/knowledge		
<b>3</b>	<b>Contacts</b>		

a	Access to internal and external subject specific databases i.e. Connecting to external computer networks to be able to consult databases and libraries.		
b	Contacts with research institutes/researchers world-wide.		
c	Contacts with businesses that employ graduates electronically.		
d	Intelligent agents which scan the Internet according to personal knowledge profiles.		
e	Stimulating co-operation between various expert suppliers (e.g. businesses).		
<b>4</b>	<b>Professional</b>		
a	Best practice resource map: a chart of information regarding networks and/or communities of practice.		
b	Centralised 'best practice' and 'lessons learned' database which is accessible for every employee.		
c	Repository: reservoir of knowledge, experiences, best and bad practices, instruments, discussions among employees.		
c	A learning environment set up to publish, and store sharable, searchable knowledge i.e. Creating collaborative environment on the intranet in which new ideas can be gathered and consolidated. This environment can be used for suggestions and search for knowledge sources.		
d	Developing expert systems in key-areas.		
e	Handbook describing procedures and instructions (quality handbook).		
f	Suggestion box.		
g	Using groupware to develop new products in a time and place independent manner.		
<b>5</b>	<b>Technology Management</b>		
a	Identifies, exploits and evaluates alternative and emerging technologies in the light of knowledge strategies and their impact on individual and organisational learning.		

b	Uses technology to link its systems to external knowledge bases e.g. academic institutions.		
c	Ensures technology is in place to access IP and knowledge assets for all employees, supported by effective training.		
<b>6</b>	<b>Supporting technologies</b> (although KM is not a technical issue, there are nevertheless a variety of technologies that can and do support companies that are active in this area)		
a	Technologies used extensively by 20% of companies today.		
b	On-line information sources.		
c	Groupware.		
d	Document management/repositories.		
e	Electronic bulletin boards.		
f	Intranet.		
g	Internet.		
h	CD ROMs.		
i	Video conferencing		
j	Simulation games and models.		
k	Data mining tools.		
l	Collaborative working systems/groupware.		
m	Workflow systems.		
n	Data warehousing.		
o	Electronic Commerce.		
p	Artificial Intelligence.		
r	Computer network systems.		

7	<b>Common Problems</b>		
a	Knowledge required for position is available.		
b	Knowledge sharing occurs despite the island nature of University departments (preventing same errors being made).		
c	Employees know how to use/interpret available information.		
d	There is sufficient or easy to come by information (present and past trends and statistics) about:		
d i	Students.		
d ii	Other universities.		
d iii	Businesses employing graduates.		
e	Sufficient knowledge available about technology to assist employees in their duties.		
f	Vital knowledge is never lost without timely warning.		
g	Faculty and Senate decisions are automatically fed into the calendar and actioned. Follow up mechanism exists for decisions made.		

### B.2.12 Information behaviour/ knowledge management (Q4.2)

Q4.2 is a shorter questionnaire that assesses the knowledge Management “Maturity” of an organisation. This version is adapted from Maier and Moseley’s KMAT (Maier and Mosely, 2003). It measures the capability of a company to instil and promote behaviours and values in its people for effective use of information. The response is by a rating scale of 1 to 5 (where 1 is poor and 5 is excellent). The same set of respondents as for Q4.1 should be targeted.

<b>Q 4.2 Information behaviour/KM (with particular reference to electronic support)</b>		
	<b>Behaviour</b>	<b>User Category</b>
		<b>Rating</b>
a	An electronic knowledge base exists to store new ideas, knowledge, solutions, and best practice.	
b	Documents are proactively shared with employees.	
c	The development of job documentation is encouraged.	
d	Information from many sources is stored in an integrated manner and cross-referenced, facilitating better communication and decision making.	
e	No policies or technical security issues prevent the sharing of information and knowledge.	
f	Documents can be posted on an organisational (intranet) portal or saved on a network server.	
g	Proactive as members actively seek out and respond to changes in their competitive environment and think about how to use this information to enhance existing and create new products and services.	
h	Information transparent as members trust each other enough to talk about failures, errors and mistakes in an open and constructive manner and without fear of unfair repercussions.	

i	Incentives are in place that motivate staff to share knowledge.	
j	The generation of new ideas and knowledge is highly valued.	
k	The information and knowledge you receive is accurate and up-to-date.	
l	An organisational intranet portal exists where information and knowledge relevant to job requirements may be retrieved.	
m	It is common practice to store work documents on an organisational server, rather than on personal computers.	
n	Electronic and/or non-electronic collaboration, teamwork, and cooperation are a part of doing business.	
o	Information is stored and organised in a way that makes it (intuitively) easy and quick to locate.	
p	Advanced technologies, (such as data warehousing, mining, and modelling), are used to leverage data and information for strategic and operational decision making.	
q	Documents stored on an organisational server or intranet contain timely and useful knowledge for job responsibilities.	
r	Expert systems and knowledge bases are used to aid in decision making.	

## **Appendix C Rhodes University Case Study**

### **C.1 Abstract**

Rhodes University (RU) is examined using the model/framework proposed. A pilot study is described which informed the creation of the framework and thereafter a formalised case study is described and discussed. From an organisational perspective, it is found to be in a stable state given the context of change. In terms of IS/ICT provision, it is found to have areas of excellence, as well as (unsurprisingly) areas needing attention. The conclusion is that IS/ICT is not used holistically or strategically enough.

### **C.2 Introduction**

Firstly, this chapter describes a pilot study that was undertaken as the first step of the research, and the results obtained from this study.

Secondly, a case study method is used to examine and describe the role of IT in supporting Rhodes University (RU) at both the strategic and tactical/operational levels. This is the first of the three chosen cases.

The chapter briefly recaps the research method used. It then examines the context of RU and then looks specifically at perceptions of IT provision in the light of the proposed framework and model.

It concludes by summarising the observations.

### **C.3 Exploratory study and survey**

A series of interviews were held at the East London campus of Rhodes University, prior to its incorporation into the University of Fort Hare, in 2003. The focus of the interviews was on transformation of HEIs, information access and quality, and the information needs of staff, especially with respect to decision-making. Briefly, the results are summarised here, but full details are available in Appendix A.



Three academic staff at senior lecturer, HoD and Dean level, and three administrative staff from middle to senior management level were interviewed. Four of these were female, and two were African. The interviews were undertaken by the author, and transcribed.

1. The term “transformation” was shown to have different meanings for different respondents.
2. The committee decision-making of the University was explored, and respondents gave balancing opinions: that this style of decision-making was open and transparent, but on the other hand, that it was open in theory only. One respondent also noted that the committee structure could be circumvented by top management making decisions without resorting to Faculty and Senate for ratification – this was seen as a sign of creeping managerialism. Decision-making was sometimes ineffective because of a lack of complete information required to make decisions. Also, there were often parallel systems for a particular issue, so that the decision was passed from committee to committee.
3. Some of the information from meetings was not documented fully enough, for example, reasons for decisions, and there was no tracking of whether decisions made at Senate were being implemented.
4. Both a lack of information (for academic decision-making) and the need to get information from individuals, and an overload of information were mentioned. The overload caused people to ignore the information, since it was sometimes unfocused.
5. The MIS type information required existed, but had to be asked for by intermediation – the system could not easily be used to obtain this information.

These responses formed the basis of issues probed during the case study.

#### ***C.4 Research process: Case study***

The study follows a case study approach using the framework (Figure C-1) through semi-structured interviews following the protocol (see Appendix B) and limited questionnaire applications as dictated by the proposed model.

The research protocol was framed from the literature, the exploratory case study, as well as the results of the two surveys conducted in 2003 (as reported in Appendix A and described in Chapter five). Established questionnaires were also used as a basis to set up the interview protocol. Some of the questionnaires were used in the full case study.

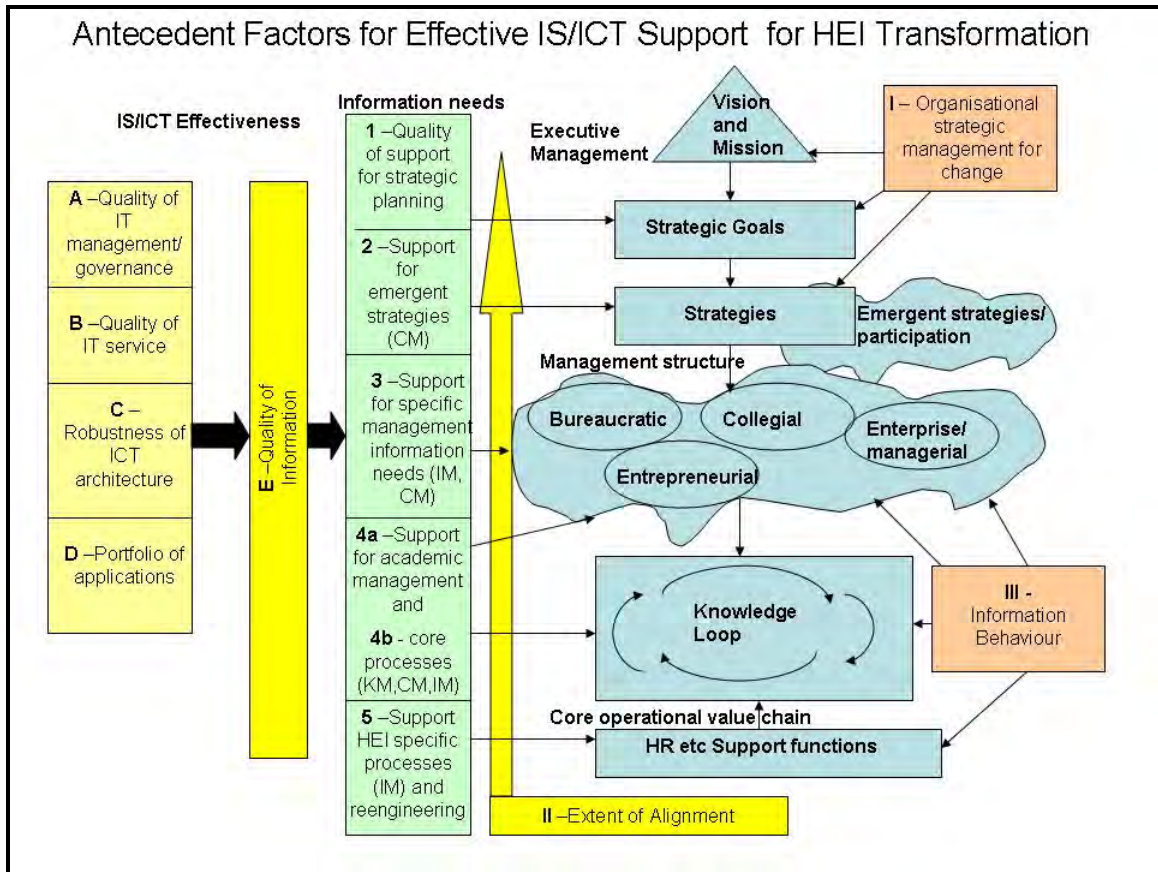


Figure C-1 Recap Analysis Model/Framework

### C.4.1 Interviews

As described in Chapter seven, the research is based largely on semi-structured interviews. These were recorded and transcribed. In some cases, the recorder was malfunctioning, so only interviewer notes were used.

#### ***C.4.1.1 Time and place***

A case study was conducted on the main campus of the University in Grahamstown in September and October of 2004. Follow up questions and corroborations of answers continued into 2005 by means of email.

#### ***C.4.1.2 Respondents***

The Vice-Chancellor, the Vice-Principal, the Registrar, the Chief Financial Officer, the Director of Planning, the Director of the Estates Division, the Director of Human Resources, the University Librarian, the IT Director, the Associate Director of the Information Systems Development Unit, the web manager, three academic Deans, two Heads of Department and three lecturers were interviewed. In addition, three mid-management administrative staff, one lecturer and three students (one post-graduate), were supplied with questionnaires by the author.

A letter was obtained from the Vice-Chancellor urging staff to assist with the research. Most respondents approached were willing to assist, but many pleaded ignorance of IT.

#### ***C.4.1.3 Protocol***

The protocol used can be found in Appendix B. At times, the conversations veered away from the designated questions, but this is normal with a semi-structured interview. The interviews were recorded and transcribed. The transcriptions were emailed to the respondents, and many replied with changes and comments.

Follow up interviews were held with key personnel to clarify some of the issues that had not been covered previously.

#### ***C.4.1.4 Ethics***

Respondents were assured that they would have the opportunity to review the transcribed interviews and most replied with changes where the rendition was inaccurate.

Confidentiality was retained by identifying the level of respondents and not individual names.

#### **C.4.2 Questionnaires**

The questionnaires in Appendix E were sent to all the respondents mentioned above. The selection sent to each was dependent on their positions. Some respondents did not complete the questionnaires, but used them as a base for discussion, which was one of the purposes of supplying the questionnaires. Most respondents completed the questionnaires during the interviews or afterwards. The results of the questionnaires were captured on spreadsheets and aggregated to provide a measure of triangulation for the interviews. Responses are shown in this chapter as tables.

### ***C.5 Rhodes University: Organisational context***

#### **C.5.1 Overall context**

RU has a long history by South African standards, and is well known for its reputation of excellence. It has not escaped the changes enforced on HEIs by the national Education Department, although these have been less cataclysmic than for most other institutions on which change was visited.

RU was established in Grahamstown, in the Eastern Cape, in 1904 and structured along the Oxbridge lines as regards the tutorial system and the principles of collegialism. It is located in what is by definition a city because of the existence of a cathedral, but is in essence a small town set in an 1820 farming community. In the city, RU is probably the largest employer. A symbiotic relationship exists between the town and RU.

Humanities has been a traditional strength at RU. RU does not have a Medical or Engineering Faculty. It offers Journalism and Pharmacy, and its Computer Science and Information Systems Departments are particularly successful.

RU was instrumental in starting a campus in Port Elizabeth, a nearby seaside city, in 1961, but withdrew in 1964 when the National Government replaced the Division with an independent, dual-medium University of Port Elizabeth, reputedly because the government

did not approve of the liberal stance taken by RU. In 1981, an East London campus was established, and was to be totally self-funding, given the lesson learned in Port Elizabeth. Despite this constraint, the campus grew and by 2003 had grown to 2000 students. This campus ran classes both in the day time and in the evening as it had started specifically to service the business community's need for further education. Interestingly, no mention of this campus is on RU's website on the history of RU.

It is a small university: 1172 employees, of which 303 are academics, 231 non-professional administrators, 64 special support, 52 technical and 38 management, and the rest largely support staff (Rhodes University Annual Report, 2004). The student population was 4974 in 2003 of which approximately half were in residence and the rest in oppidan accommodation, and had an academic staff to student ratio of 19:1. Students are largely from elsewhere in the country with approximately 30% from the Eastern Cape, and 28% foreign (mainly from Zimbabwe, but also elsewhere). It is estimated that given the decline in student numbers, a target of under 6000 is the maximum for the near future (Rhodes University Institutional Plan, 2003). Growth is constrained by the need for residential accommodation, which is a feature and strength of RU.

It has been quoted that smaller institutions are economically unsustainable and this has been the reason for Government to encourage, and institutions to engage in, growth and mergers. However, a study by Taylor and Harris (2002) seems to negate this contention as RU is proven to be particularly successful financially. It also reportedly had the highest per capita research output on average in South Africa in 2004, its throughput rate is also the highest and it is economically one of the most viable (SAd<sup>2</sup>, 2004; SAd, 2004; Taylor and Harris, 2002).

RU has a reputation for quality, and the quality of its student life is almost an anachronism in South Africa, if not wider, because of the size and location of both RU and the city. It is also an expensive University both as regards tuition fees and residence fees. The motto of RU is "Where leaders learn", and a large proportion of alumni are indeed in important positions

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<sup>2</sup> SAd = Senior Administrator; SAc = Senior Academic as described in the Glossary

in South African organisations (as well as internationally). It is said to have an international reputation (although this is arguable).

#### ***C.5.1.1 Mergers: Divestiture***

The changing educational policies and laws have forced changes on Universities and Technikons. One of the most disruptive changes has been the forced mergers of institutions, as discussed in Chapter three. RU was less affected by the merging initiative than most other institutions. RU ceded its satellite campus based in the city of East London to the neighbouring University of Fort Hare as required by the Department of Education. The fact that top management appeared to cede this campus with not a great deal of protest or care for its staff, many of whom had served the institution loyally and devotedly for upwards of 15 years, in order to retain its other activities (and culture) unchanged, was viewed bitterly by the affected academics and administrative staff. The cession had no major impact on the main campus. Indeed, in some cases, it made the functioning of the main campus easier as there had always been a cultural difference between the two. The satellite campus had always been more entrepreneurial and involved in the community and its apparent needs.

#### **C.5.2 Structure**

RU has the usual structure. It has a Council which has final decision-making ability composed of luminaries from outside RU, with some representation of University staff, and with the management staff in attendance. Membership of Council has changed to involve a wider cross section of society. A non-executive Chancellor heads the institution, with an executive Vice-Chancellor assisted by a Vice-Principal or Pro-Vice-Chancellor (VP). RU is in the process of electing a new Vice-Chancellor (VC). Faculties are headed by Deans, and consist of Departments headed by Heads of Departments. The Departmental system has been retained instead of moving to a “School”-based system and academic “programmes”. Research and other institutes exist and a wide range of Community projects are listed. The normal senate sub-committees exist, as well as an executive management committee, and an institutional forum.

### **C.5.3 Strategic management**

#### ***C.5.3.1 Strategic management, vision and mission***

RU has followed methods of rational management by having most facets of strategic management in place. RU has formal planning in place. Planning is usually done using a three-year rolling cycle with annual quality reviews (SAd, 2004). It has a vision and mission statement and objectives and strategies to achieve these. The published mission and vision statement can be found on the web site.

#### ***C.5.3.2 Strategic thrust with respect to change***

Extracts relevant to change are paraphrased here.

- “To develop shared values;
- To redress past imbalances and to recognise the inadequate educational preparation of many of its students and to offer special assistance to them, without prejudicing the high academic standards of the University;
- To create a research-based teaching and learning environment and to promote excellence in research;
- To provide a safe and well-equipped environment and a safe and nurturing student support system;
- To promote inter-disciplinary and inter-institutional collaboration within the Eastern Cape Province; to assist in the development of the Eastern Cape Province and to conduct applied research so as to contribute to the general welfare of the people of southern Africa, and to meet their special needs; and
- To promote a culture of environmental concern” (Rhodes University Website).

### **C.5.3.3        *Strategic objectives/change drivers***

The national Education Department has required all institutions to submit Institutional Strategic Plans. The 2004-2006 plans are required to be focused on limited transformational goals, with reference to the first submitted set of plans for the 2000-2002 period (SAd, 2004).

The published limited transformational goals of RU are:

- “Student enrolment and outputs;
- Student equity (racially representative demographically);
- Staff equity (racially representative);
- The transformation of Institutional cultures”. (Rhodes University Website).

From interviews conducted in 2004 (September and October) with Senior Administration and members of staff, the following were the most important issues driving change:

- Need to adhere to Government policies
- Research
- Need to generate unencumbered funds
- Employment Equity
- Student Demographic profile and open access
- Throughput rate
- Campus Safety
- Globalisation
- Mixed mode teaching.

Strategies have been put in place to cope with these objectives as shown by responses from respondents in Table C-1.

Respondents: 3 Senior Administrators, and 1 IT manager.



<b>Q1.1 Strategic objectives and drivers of change</b>	
<b>Objectives</b>	<b>Strategies to realise these</b>
Government Policy	Policies and practices are reviewed to ensure quality and compliance (preparation for the quality audit in 2005 is giving impetus to this issue).
Research	Massive drive to stress importance of research and aim for an average 1.5 units for research/academic.
Resource squeeze/ Search for external funding	A successful fundraising strategy especially with the centennial year strategy, and the VC as the main fundraiser.
Employment Equity	An equity policy is in place.
Demography	A target for South African Black students is in place.
Open Access	New admission policies are being used, for example, AARP tests will be administered.
Throughput Rate	Teaching, Assessment, and Curriculum policies exist.

**Table C-1 Strategies**

#### ***C.5.3.4 Emergent change***

According to one senior academic, RU has become more democratic in recent years, as it “would have been unthinkable in the past for debate in Senate around the architecture of an administrative block for example” (SAc, 2003). Internally RU is experiencing greater diversity and the culture is more tolerant thereof and more sensitivity towards gender equity has arisen. Management styles are less hierarchical and greater transparency on all but staffing issues is apparent (SAd, 2004).

Some academics felt that the student body was changing in demography, but also in values. A top senior academic said that in his experience of teaching at RU, “they are applying themselves less and this can be attributed to the effect of technology. They expect all material to be accessible electronically with no need to go and find any other. This has an

affect on their class attendance as well as self-motivated learning” (SAc, 2004). (Is this, however, not a common refrain amongst academics through the ages!). Class sizes have grown especially at first year levels which is eroding one of the strengths of teaching at RU: the close interaction between lecturers and students (although, as noted in Section C.5.1, the student ratio is remarkably good).

Students are more and more being treated as “clients”. Many were acting as such: “insisting on their rights” and insisting on information. In one academic’s opinion, “they have a right to this (mark information) provided they bring their side to the bargain, for example, a student who does not attend has less right to information or sight of a script than a student who does, for example” (Ac,2003).

#### ***C.5.3.5 Success of strategies***

RU has policies and strategies that echo its vision and mission. Policies are in place to address diversity, support structures exist to help less “ready” students and ensure that the throughput remains good, and strategies exist to foster staff equity and various other measures to sensitise the RU community to the changing nature of the institutional environment (ExMgm, 2004). The success of its strategies can be measured in some cases, but in others it is a matter of perception. The view of top management is shown in Table C-2 (SAd, ExMgm, 2004) as derived from interviews.

Respondents: 3 Senior Administrators and 1 IT Manager.

Rating Scale: 1-5 where 5 = “Very Successful”, and 1 = “Unsuccessful”.

<b>Q1.1 Driver for change</b>	
<b>Drivers</b>	<b>Success of strategies</b>
Government Policy	4.0
Research	3.7
Resource squeeze/ Search for external funding	4.7
Employment Equity	3.3
Demography	2.5
Campus safety	4.0
Open Access	2.5
Technology Push	3.3
Throughput rate	5.0
Globalisation	3.0
Mixed mode teaching delivery	3.0
Massification/ capping of numbers	2.0
Mergers	2.5
Community Involvement <sup>3</sup>	

**Table C-2 Senior management perception of success (SAd, ExMgm, 2004)**

RU's senior management seems to be comfortable with its progress towards achieving self- and government-imposed objectives. RU's throughput rate was quoted as being the best in the country, and the research output similarly was quoted as the best in South Africa per capita in 2004 (SAd, 2004). The search for external funding is viewed as successful, especially by virtue of the centenary fundraising initiative. The strategy to cope with the requirement for a more representative student population was being advanced by being more

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<sup>3</sup> Mentioned, but not rated

flexible in recognising potential, and not just being geared to recruiting upper-middle class students. The recruitment process was viewed as good.

More concrete measures of the success rate are contained in the Audit Report produced in 2005, which indicates the following: Research output increased from 2003 to 2004 by 11% from a satisfactory output rate in 2003. Research degree enrolments in 2004 were up from 2003 although the figures for 2005 appear to be static, and the number of international students has grown markedly in 2005. In 2005, its alternate entry routes were still low (although this may change for 2006). Undergraduate completion rates have been fairly static for the last three years. Graduation rates are quoted as an average of 21% in 2004, and in most categories have been above the benchmark percentages (Rhodes University, 2004; 2005) and the 18% industry average quoted in the DoE enrolment report, (HESA, 2005). Academic staff qualifications have increased in 2005 from those in 2004. As regards “Community Engagement” or community involvement, the report details over 30 diverse initiatives spanning multiple departments. Outreach programmes with schools are also numerous. As regards employment equity, RU struggles (as do all HEIs) to attract and retain good African employees as the competition from industry and government is well-nigh irresistible. “Growing own timber” is equally difficult, as African students are employed before they graduate.

There seems to be an honest desire to change as required by Government policy and the (perhaps newly) perceived needs of being a South African University. However, the change is slow. Some academics hold this as good (SAc, 2004), as slow change implies that excellence is not lost in the process of change. Reputation is vital to RU and is being carefully guarded. RU is therefore approaching change with caution. It is changing the mindset within by attempting to make staff culturally more conscious of diversity, but trying to maintain or craft the values that have contributed to its success. Other academics see the change as slow and sometimes unnecessarily so (SAc, 2003).

#### **C.5.3.6        *Culture***

The staff are on the whole proud of and loyal to RU. The pursuit of quality is embraced by all staff interviewed, academic and administrative. Senior staff members especially (as well

as students) are proud of the reputation of RU. They tend to strive for professionalism. Value systems are in place that are fairly commonly “bought into”. Working for the good of the institution is a norm – staff are prepared to put up with lack of frills, for example, at conferences and workshops they would share cars and not opt for expensive accommodation so as to save costs for the institution. There is a “sense of austerity” (SAc, 2005). Staff members are happy to “go the extra mile” to support each other and the institution (SAd, 2004).

The lecturing staff work hard and are as poorly paid as elsewhere in South Africa. The lecturing staff are committed to their students and teaching excellence. Missing a lecture, and worse, doing so unannounced, is viewed as a major offence for academic staff. It is rare that lecturing staff attend meetings, workshops, conferences or other activities at the expense of a lecture. A new senior academic states: “The main attraction for me was RU’s focus on departments that are discipline-based, unlike, for example, Wits. It is a small institution and eye contact with students is possible. Grahamstown is a small place and you can concentrate as you don’t have distractions of a city for an academic. Technology reduces the isolation” (SAc, 2004). For academic staff, the distance from an airport is a limiting factor for academic pursuits such as conference attendance and meeting peers.

The informal networks are good because of the size of RU, as well as the size of the city in which it is situated. This is seen as something which needs to be expanded consciously to include the more diverse staff and students now involved (ExMgm). Given the nature of academics, staff are largely friendly and mutually supportive. The present Vice-Chancellor is approachable and direct. He is very involved in a practical way with what is happening within RU (“hands-on”) and well-respected internationally as an academic<sup>4</sup>.

Contributing to the sense of closeness is the fact that staff members are forced to live within a certain distance of the campus, and this prevents staff members from leaving work early to go back home elsewhere.

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<sup>4</sup> A new VC takes over in 2006

A good rapport exists between students and staff, in all likelihood fostered by the staff/student ratio, but mostly by the residence system which is well run through a strong wardening system: “The residence system is also a major advantage for RU. This allows students to migrate from home to independence as a soft passage. Universities are more than just classrooms. They also get inducted into life skills and governance – the total University experience. The students are more likely to attend seminars because they are on campus – a sense of intellectual community. The University of the Witwatersrand (Wits) has residences but only a certain sector of students stay there and it does not have the same benefits. RU spends a lot of attention on the residence system” (SAc). Because of the size of the city, limited off campus activities and entertainment for students exist, and RU has a reputation, perhaps undeservedly, of student drinking: one senior staff member noted that this was just more visible in such a small city and that in large cities students behaved the same way, but were less visible.

Also on the negative side, opinions were voiced that the culture at RU has been very much a male dominated, Eurocentric, old-boy inner circle network. This is changing, but slowly (Ac, 2004, SAc, 2003). However, in the author’s experience, RU staff are particularly gender sensitive with respect to language use. Some mistrust between academics and administration is evident, mainly voiced by more junior academics. Black staff reportedly felt estranged from the dominating culture: “Black staff questioned on whether they found RU ‘white, male and colonial’ responded yes, and RU is concerned about this but does not know how to remedy it. It has a small closely knit society and the smallness allows for initial friendliness but thereafter the relationships are pretty tightly formed already and it is difficult to ‘plug into’” (SAc, 2004).

#### **C.5.4 Students**

Students have in the past come from a largely middle to upper class white society, and were carefully screened for academic ability using a Swedish Point system whereby the school leaving symbols obtained for subjects were graded according to the grade they were achieved in (Higher Grade or Standard Grade). They were a reasonably homogeneous group with

largely shared cultural values. With the changing demography, this is changing. Successful students have had a good reputation in the market place.

## **C.5.5 Management and decision-making style**

### ***C.5.5.1 Management style and structure***

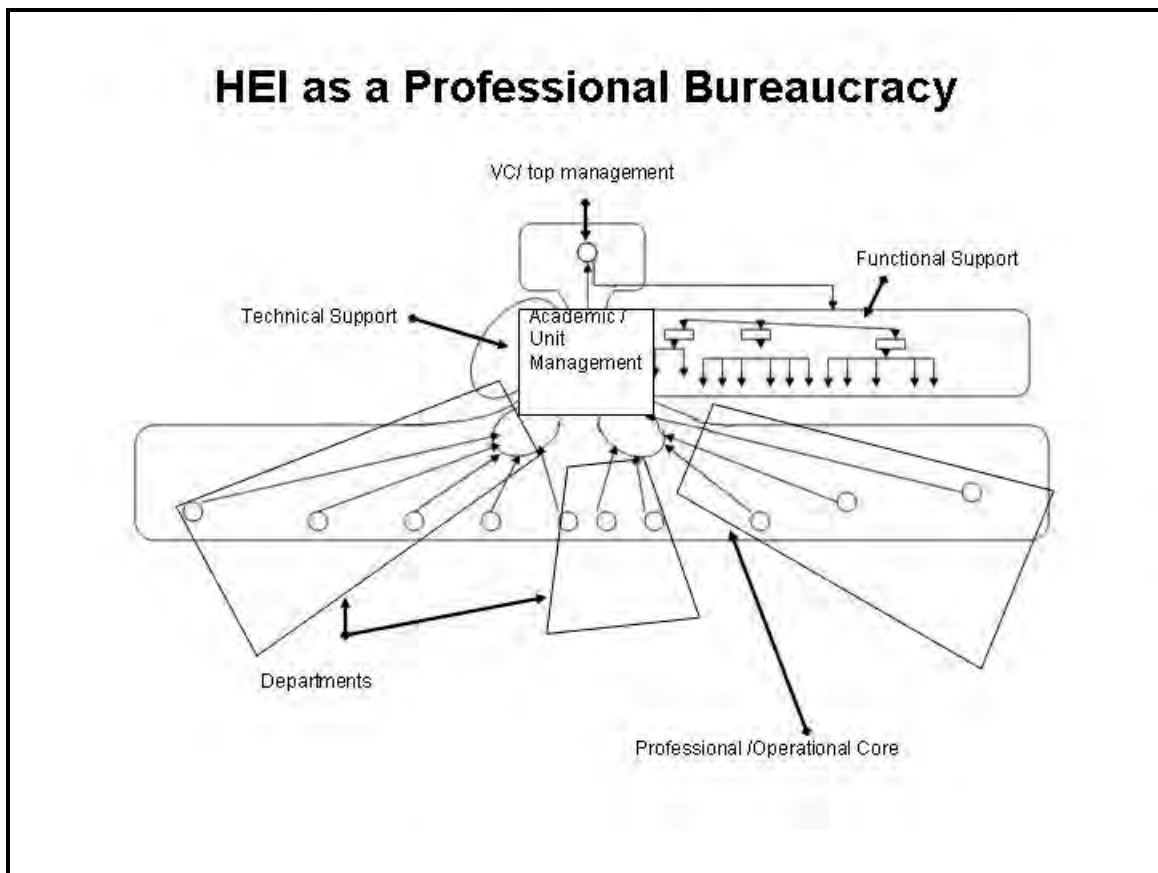
RU is run on democratic lines. It fits into the collegial quadrant (Dobson and McNay, 1996), while also being bureaucratic with the use of committees and sub-committees to enable decision-making. RU is committed to participative management, transparency, accountability and openness in decision-making (Rhodes University Institutional Plan, 2003). The perception exists that there is a great deal more transparency than in previous years and top management is very responsive (SAC, 2004). The committee system allows for participation in decision-making, and for checks and balances. The formation of the Institutional Forum (see Appendix F for a description of its functions) has facilitated the formation of a shared and agreed upon mission and vision for RU.

Faculties and Senate are powerful. In the past, membership of the Faculty boards was limited by rank, but not any longer. Senate membership is limited to senior academics, but student representation, as well as representation of non-academic members exists. The Deans provide strong academic leadership. They are full-time academics who have varying teaching loads. They make judgment decisions regarding students and interpretation of faculty rules. What used to be Faculty officers have been grouped into a “Student Bureau” to provide a seamless service to students. The student bureau thus fulfils the role of Faculty officers as well as registrar related duties. Although Deans have not been happy with this arrangement (as they felt the loss of the Faculty officers caused inefficiencies), it has provided a speedier and cost effective service to students.

On the negative side, despite the executive stating firmly that “if they think that RU is driven by an old-boy network, they do not know how the university works. There is no kitchen cabinet here. Committees allow for democracy” (VC, 2004), some other opinions were raised by staff below the level of Heads of Department. It was stated that despite all the committee structures mentioned, the normal decision-making structures could be

circumvented. Important decisions were sometimes made by the top management without going through these structures. RU was seen as increasingly being managed by the senior executive (managerialism). The effect of this was seen to be “disconnecting” people lower down and disempowering them (SAc, 2003, Ac 2004). The following was stated: “RU has a culture of management doing things non-transparently. Rumour has it that administration saves money and gets patted on the back (or perhaps even gets rewarded) for this and therefore budgets get under-spent and teaching suffers. If this is so, it is bad – if it is not, then communications regarding under-spending is also bad” (new Academic, 2004). Frustration at the perceived conservatism in new ventures and the slow rate of change also exists (SAc, 2004). Despite the fact that academics complain about the numbers of meetings they are involved in, they demand to be involved in decision-making.

**C.5.5.2 Management structure**



**Figure C-2 Professional bureaucracy adapted**



Using the adapted Minzberg model of a professional bureaucracy (Figure C-2 reproduced), RU maintains traditional disciplinary/departmental boundaries, with low interaction between them. However, given the size of the University, cross-pollination occurs between academics of different disciplines.

Academic Management is a factor, but since Deans do not serve as Executive Deans (at the time of writing), this particular aspect may be of less impact than in other HEIs, where Deans have greater executive power. Top management is thinly spread, and this has been highlighted as a source of concern by top management (SAd, 2003), making a managerial approach more difficult. Technical support has grown with a Planning Director, Academic Support staff, and Quality Assurance staff. In some cases, functional support units have decreased in size – a case in point is the Registrar’s Division.

#### ***C.5.5.3 Decision-making balance***

As stated, RU operates in a mixed mode of collegial and bureaucratic, where most decisions are made by committees, but often influenced by collegial lobbying and Senate decisions. The committee structures do not facilitate rapid decision-making or responses. It is stated, however, that “the buy-in you get makes for better decisions” and “RU CAN move fast: a 3 month delay is not a long time for big decisions. Being small again helps speed things up” (VC, 2004). This mix of collegial and bureaucratic cannot work for larger institutions: “larger Universities are like super-tankers having to turn. Collegial would not work for larger universities. All work is done by committees and by the time the issue gets to Senate, the decision is made already” (VC, 2004).

A point of view was offered implying that formal systems are less important: “It is quite a small organisation as HEIs go, and can at times operate outside the formal structures” (SAd, 2004). “The informal networks are good and people are usually well-informed by the grapevine about what is happening. In this way it can at times counter the otherwise slow rate of change” (SAd, 2004). The other side of the coin is that this informal network also affects transparency, as noted in more negative opinions in the next paragraph. Informal

ways of handling matters work because of the size of RU. This does create more flexibility and can counter inefficient or restrictive processes.

Negative opinions on decision-making were made. Opinions were voiced that there were flaws in the committee system such as that information was not being filtered back from the committees to the staff (SAc, 2003). “People were now more aware of their powerlessness”. “At departmental level decisions were made consultatively (the famed collegiality aspect), but that there was not wide enough participation on committee structures where other decisions were made”. It was reported that there was the perception that “there was still an old boy network and some information could be obtained only by using individuals and networks” (SAc – EL, 2003). “Reporting structures were complex. There were very confused reporting lines (this is common in HEIs) so decision-making was hampered”. The opinion was voiced that decision-making was “open in theory but not in actuality” and “the university gave people responsibility without authority” (SAc – EL, 2003). The opinion was stated that “the university was very accountable to students (transparent) but less so to staff” (Ac, 2003), and another that “top management is less aware of the needs of junior staff than they were of students’ needs (Ac, 2004).

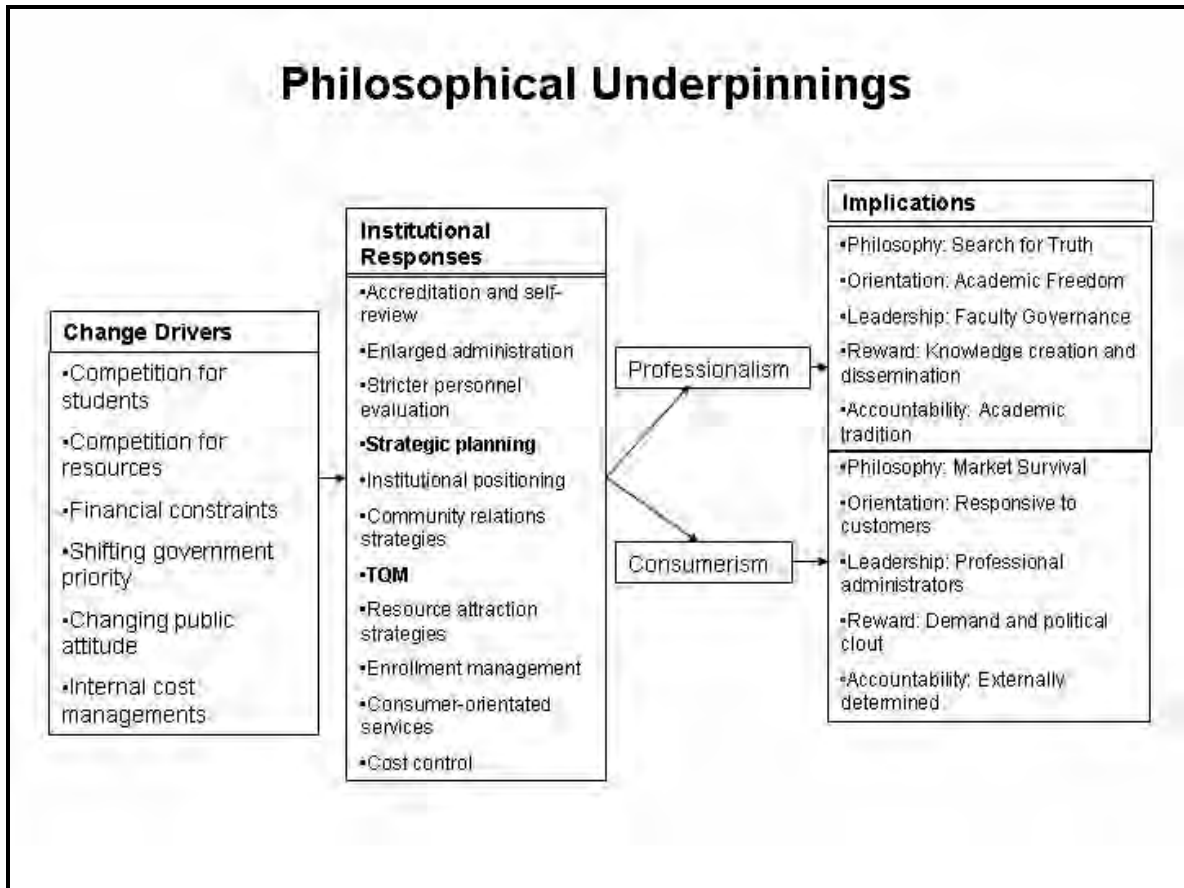


Figure C-3 Philosophical Underpinnings – Michael (1997)

Examining RU through Michael’s categorisation (Figure C-3), RU falls into the “Professionalism” category

### C.5.6 Process effectiveness

The administration processes in place are effective, although they may not be the most efficient. Administrative delays still occur in some of the processes. As with most Universities, the areas that cause a great deal of frustration are the Human Resources (HR) processes, although a statistic of 3 months from a staff vacancy to an offer was mentioned as the average (SAd, 2004). Student registration used to be a major source of frustration for staff and students, but these processes have become efficient. Response time in admissions

has become an area where RU excels (2x SAd, 2004; SAc, 2003). Top management interviewed felt that processes were on average very effective and efficient (2x SAd, 2004).

## **C.6 IS/ICT strategic management**

### **C.6.1 IS/ICT importance**

Everyone interviewed stated that IT was of extreme strategic importance for RU. IS/ICT was viewed as vital by the VC. The VC stated that IT was

- “critically important:
- As education IT is very important- young people as graduates need to be accomplished in IT. From a research point of view, IT is vital. We are fortunate to be successful in this regard with the Centre of Excellence<sup>5</sup> being recognised.
- From an academic point of view IT is a critical part of a modern University.
- It is central for running a concern. If that slips, everything slips. It is vital for planning, producing the digest of statistics, indeed to do anything from a planning point of view.
- Communicating is important. It has transformed the academic life in Grahamstown. Before we were really isolated, now we are in contact with the world. The attraction of RU is advanced by this. In last eight years we have noticed a huge difference by virtue of communication usage and volume” (VC, 2004).

The IT Director stated that senior academics and administration held the view that IS/ICT was necessary for the functioning of the institution, but should not/ did not drive the institution (ITMgm, 2003).

As regards reporting, the IT Director reports to the VP, but when questioned about this, the VC stated that the reporting line was to the VC’s office. The IT Director sits on the

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<sup>5</sup> Telkom Centres of Excellence <http://coe.ru.ac.za/about/#Telkom> (see Appendix F for extract from the web page describing the purpose and activities)

management team which meets once a week. This was not the case with previous directors and there used to be a somewhat adversarial relationship with Management. The IT Director is part of the “bosberaad” in which the planning for RU takes place. The IT Director is also “in attendance” at Council meetings.

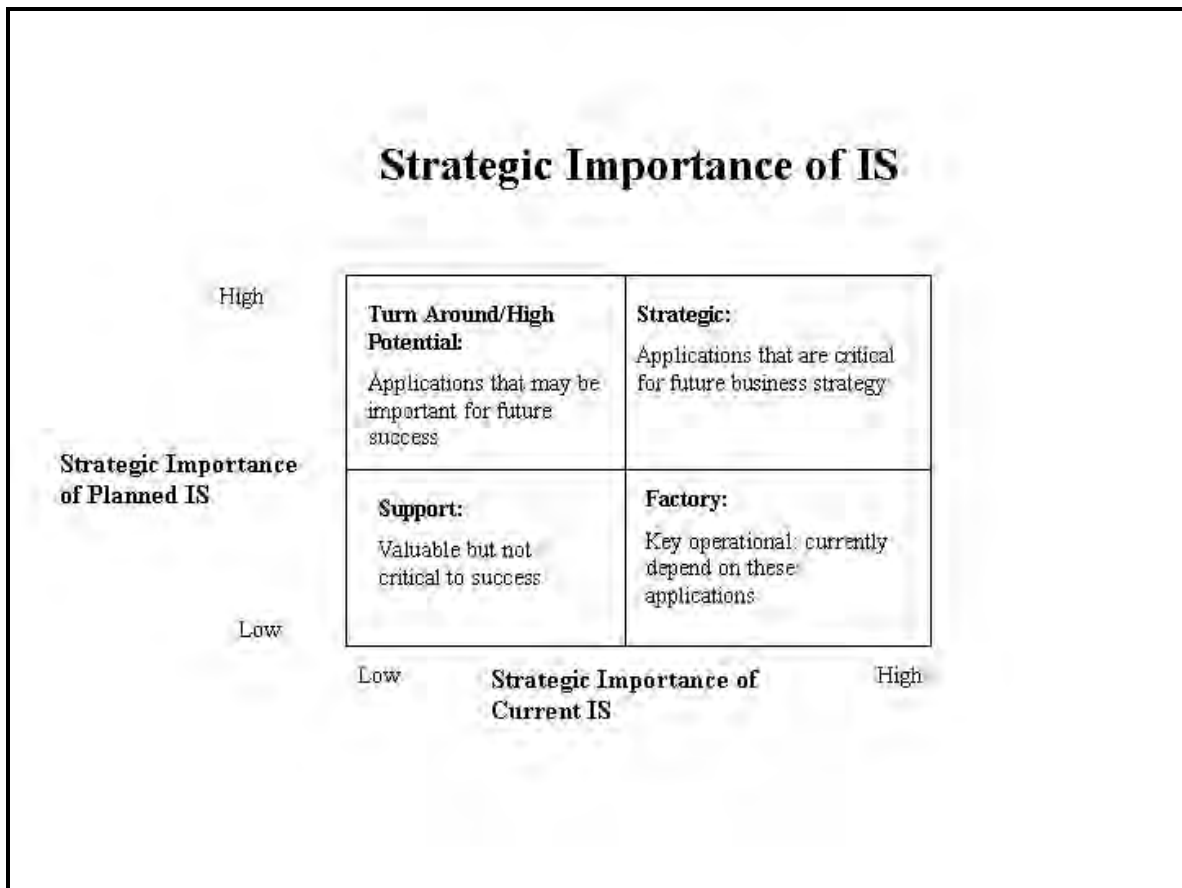


Figure C-4 Strategic Importance - McFarlan and McKenney (in Ward and Peppard, 2002)

If McFarlan’s grid is used (reproduced from Chapter three, Figure 10), the left bottom quadrant is the view of IT held by most administrators and management as valuable, but not critical to success. Some academics stated that “if the administrative system were to be taken out, things would continue to happen” (SAC, 2004), while others stated that IT was vital (right bottom quadrant of “key operational: dependent on these applications” on the

grid). The fact that the budget for IT is low substantiates this view of IT at an estimate of < 10% of University budget (ITMgm, 2004).

A good relationship exists between the IT Director and the Vice-Chancellor and the view of IT has changed in the last few years - it is no longer viewed as a bottomless drain on finances as it arguably was earlier. The previous Director of Finance (or CFO as shown for brevity purposes on the organogram) spent some time in managing the Division while it was without a Director and mutual understanding and respect resulted contributing to a greater understanding of the role of IT (ITMgm, ExMgm, 2004).

### **C.6.2 Background**

RU's IT staff are acknowledged for their technical excellence with reputations stretching widely externally and recognised internally. "Everyone speaks highly of what IT people do. Tremendous quality exists" (SAd, 2003).

RU is known for the fact that it was at the forefront of introducing Email and web access into the country. The IT Division prides itself on having sourced funds to connect 2500 rooms in residences to the network. Their bandwidth management is excellent. They use a quota control system that "avoids congestion and 'flat-lining' while still allowing 'free' Internet access to all staff and students" (ITMgm, 2004). The Division also runs and hosts the SEALS shared library server for Eastern Cape academic institutions. Laboratory access to all students was ahead of the pack, although this may no longer be the case (Ad, 2004).

The provision of electronic teaching equipment has been less good, but this is being resolved by a steady roll-out plan. This has not been communicated to all (or not well enough), and thus users of smaller venues grumble about the quality of equipment (Ac, 2004). The proliferation of laboratories under departmental control is not desirable (ITMgm, 2003), because of a lack of skilled system support in the departments, and this type of decentralisation causes problems in the long run.

#### **C.6.2.1 *IT provision ratios***

RU had, at the time of the survey in 2003, 5 open laboratories containing 300 workstations; 10 specialised laboratories (in Departments like Computer Science) with 600 workstations in

these; 80 library workstations; and 1000 workstations for staff members' use as office workstations. 15 servers are administered by IT and 20 administered by departments.

The IT Division services approximately 5000 students, 300 academic and 700 administrative and support staff. At the time of the 2003 survey, 30 IT staff reported to the IT Director, giving rise to the following statistics:

33 staff to 1 IT staff (where the HEI national average is 54 to 1 according to the pilot survey conducted by the author – see Appendix A); 167 students per IT staff member (HEI average 53 to 1). The ratio of students to workstations in open laboratories is 17 to 1 which compares favourably with the HEI ratio of 34 to 1, as well as 43 workstations to 1 IT staff member (HEI average is 70 to 1).

RU is thus comparatively well-resourced in this respect.

### **C.6.3 Strategic planning and management (SIPM)**

As regards strategic planning, a set of strategic objectives exist as formulated for the previous Administrative Review in 2003. This was the first time such planning occurred and the planning was to be refined in the next planning session (ITMgm, 2003). Planning was done on an informal basis and based on the analysis of information needs.

An opinion was voiced by a senior staff member that “we do not have an overall IT strategic plan. A lot of separate policies exist but have never been pulled together as an IT strategy”. This was contrasted with the Stellenbosch eCampus initiative “where everyone was involved. They know where they are going. We seem to be a bit ad hoc although it works very well” (SAd, 2003).

The IT Director echoed that textbook strategic management was not being done. A vision and mission statement was formulated in 1996 and some of it is repeated below (from the web site):

“To support the vision of Rhodes University becoming and remaining the best university in South Africa, the IT Division undertakes to:

- provide more information technology access per student than any other university in South Africa
- promote the policy of placing on the desk of every academic member of staff information technology equipment which is both appropriate to the task at hand and cost effective
- design systems which will enhance the life of the academic user by permitting access to student records and relevant administrative information
- pursue a policy of "self-service computing" in terms of which all users can help themselves by way of directly extracting and updating information according to their needs.

In carrying out its mission, the IT Division undertakes at all times to:

- develop a culture of service and to be service-orientated in all its relations with users
- be responsive to the ongoing and changing needs of its target users
- co-ordinate RU's efforts to provide integrated information resources and processes
- streamline administrative processes and eliminate redundancy of information and processes
- be proactive in leading RU towards new technological solutions in its daily business
- establish mechanisms to support the decentralisation of authority and responsibility to reflect more accurately RU's structure and ethos
- empower staff to maximise their skills and abilities and to enable them to fully and effectively use all available tools
- be proactive in developing and implementing a programme for the renewal of redundant technology "(RU website).

The actual strategies to achieve the above are not published. The strategies published for the "IT Admin Review" (2003), have objectives in place phrased as "Internet bandwidth", "User



authentication”, “Telephony”, “Disaster Recovery”. The focus is on technology planning and management for a robust technology (hardware and networks). These objectives are consonant with the function of the IT Division. Although the IT Admin review report mentions information needs, for example to “co-ordinate RU’s efforts to provide integrated information resources and processes”, it notes that this is an area that needs “review in a wider context”. When the planning is viewed in terms of the proposed model for strategic planning, (as adapted from Earl and depicted in Figure 6-5), it is evident that the planning components for information management and knowledge and communication management are mostly missing, while technology planning is catered for. A strategy of the Data Unit is to try to centralise the many decentralised databases as much as possible. The IT director noted that “the objectives that arose were probably not long-term enough and tended to be more operational and too many items were highlighted – ‘pragmatic issues rather than grand schemes’” (ITMgm, 2004).

#### **C.6.4 Knowledge and Communications Management**

As noted in the section above, the strategic planning facet of KM and CM do not form part of IT’s strategic planning.

### **C.7 *Extent of Alignment***

On being questioned regarding the level of strategic alignment, respondents stated that alignment was achieved by virtue of the fact that the IT Director was part of the Executive Management Team and was thus in touch with the strategic needs of RU (ITMgm, 2004).

This opinion corresponds with other comments about the informal flow of information through personal contact between staff (SAd, 2004). A senior academic felt that there was a great deal of consonance with RU needs (SAd, 2004). The representation of IT at this level is important and relatively recent.

The alignment maturity index was calculated according to interviews based on the maturity questionnaire, and averaged. Table C-3 gives the summarised maturity index by category and overall, while Table C-4 shows full results, and areas of significant differences between

the two groups. These results are used for confirmation of the perceptions and sentiments noted.

Respondents: 5 senior managers including executive managers (Users) and two senior IT managers (IT).

Rating scale: 1-5 where 1 = “Lowest level of maturity” and 5 = “Highest level of maturity”.

<b>Q1.2 Alignment Maturity Index</b>			
<b>Alignment Category</b>	<b>Users</b>	<b>IT</b>	<b>All</b>
Communications	3.4	2.9	3.2
Competence/Value metrics	2.9	2.5	2.7
Governance	2.9	3.8	3.1
Partnership	3.6	2.3	3.2
Scope and Architecture	3.3	2.0	2.9
Architectural integration:	3.0	3.0	3.0
Skills	2.9	2.4	2.7
Average	3.1	2.7	3.0

**Table C-3 Alignment Maturity Index by category**

Management and IT views diverge slightly, with IT having a more negative view of alignment. The average rating is 3.

The full table indicates areas of disagreement between the two categories of respondents (bold-typed). The areas of interest are where the opinions of IT management and senior management diverge by a rating of 2 or more (chosen arbitrarily by the author).

<b>Q1.2 Alignment Maturity</b>			
<b>Category and Issues</b>		<b>Users</b>	<b>IT</b>
<b>1. Communications</b>			
1.1	Understanding of business by IT	4.3	3.0
1.2	Understanding of IT by business	3.3	2.0
1.3	Inter/intra-organisational learning	2.7	3.0
1.4	Style and ease of access	3.7	4.0
1.5	Knowledge sharing/leveraging intellectual assets	3.3	2.5
1.6	IT staff/business liaison	3.0	3.0
Average		3.4	2.9
<b>2. Competence/Value metrics</b>			
2.1	IT metrics	3.0	2.0
2.2	Business metrics	1.5	3.0
2.3	Link between IT and business metrics	3.0	2.0
2.4	Service level agreements of IT function	2.5	3.0
2.5	Benchmarking	3.7	2.5
2.6	Formal assessment / reviews of IT investments	3.3	2.5
2.7	Continuous improvement practices	3.3	2.5
Average		2.9	2.5
<b>3. Governance</b>			
3.1	Formal business strategic planning	3.7	3.5
3.2	IT strategic planning	3.0	4.5
3.3	Organisational structure	2.3	4.0
<b>3.3</b>	<b>Reporting relationships</b>	<b>1.7</b>	<b>5.0</b>
3.4	Budgetary control	2.0	3.0
3.5	Rationale for IT spending	3.5	5.0
3.6	Steering committee	3.5	3.0
3.7	Prioritisation process	3.7	2.0

Average		2.9	3.8
<b>4. Partnership</b>			
<b>4.1</b>	<b>Business perception of IT value</b>	<b>4.0</b>	<b>1.0</b>
4.2	Role of IT in strategic business planning	3.0	2.0
4.3	Shared goals, risk, rewards/penalties	3.5	3.0
4.4	Managing the IT-business relationship	3.5	2.5
4.5	Relationship / trust style	3.5	4.5
<b>4.6</b>	<b>Business sponsor/champion</b>	<b>4.0</b>	<b>1.0</b>
Average		3.2	2.3
<b>5. Scope and Architecture</b>			
5.1	Primary systems	3.0	3.0
<b>5.2</b>	<b>Standards articulation</b>	<b>3.5</b>	<b>1.0</b>
5.3	Architectural integration: Systems across the organisation	3.0	3.0
5.4	Architectural integration: Architectural transparency,	3.0	3.0
Average		3.1	2.5
<b>6. Skills</b>			
6.1	Innovation, entrepreneurship	3.0	3.0
6.2	Key IT HR decisions made by business management	3.0	4.0
6.3	Change readiness	2.5	2.0
6.4	Career crossover	2.0	2.0
6.5	Education, cross-training	2.0	2.0
6.6	Social, political, trusting environment	4.0	2.5
<b>6.7</b>	<b>Attract and retain top talent</b>	<b>3.5</b>	<b>1.5</b>
Average		2.9	2.4
<b>Overall Average</b>		<b>3.2</b>	<b>2.7</b>

**Table C-4 Maturity Index in detail (points of divergence)**

As can be seen from Table C-4, and somewhat surprisingly given the statements made previously by participants, the communication and partnership between the two groups are viewed differently and fairly negatively by IT. The full table highlights areas of greater differentiation. For example, IT rates attracting and retaining top talent at 1 while top management rates this at 3.5. IT feels the lack of a business champion whereas top management rates this at 4. The overall maturity index is 3, which is higher than the 2.5 midpoint ranking. However, the survey indicates that communications between the two groups can be improved, or is an area that needs further investigation.

Despite having the perceived mismatch of well defined organisational strategies and goals with informal IS/ICT strategic planning (SISP), IT is thus seen as supporting the organisation strategically. The alignment of IS/ICT with strategic organisational aims was seen as close, but not because of “text-book” methods: RU is small and people were kept well-informed and were aware of the needs of the organisation.

## ***C.8 Implementation and monitoring***

Once strategies are established, their implementation and monitoring is important, as well as measures of how well the implementation is supporting the needs of the organisation. No formal management techniques such as the Balanced Scorecard System monitor the performance of the IT Division. Perceptions of service with respect to information provision were collected from interviews, especially as related to the specific information needs of groups of users.

## ***C.9 Support for tactical, management needs***

### ***C.9.1.1 IT support for management decision-making***

No mention or ideas regarding the use of IT for improving decision-making was offered, apart from the comments on better information provision and targeted information. One senior academic stated that information provided for decisions in committees was often hard to interpret and base decisions and opinions on. Targeted or tailored information would assist (SAc, 2003).

A problem mentioned was that of information overload: “For academics (and possibly administrative staff) there was often an overload of information. A large number of repetitive documents bounced between committees. Information was often ignored because of the overload, or the information was not trusted, or people were disengaged from the aims of the organisation” (SAc, 2003).

### ***C.9.1.2 Academic management***

The supply of information to meet the needs of academic management appears problematic. Academic managers complain about the lack of support for academic management. A more trenchant set of comments stated that academic information needs were NOT being met: “If anyone says yes, it is because they are used to a donkey-cart mentality. There is a lack of integrated information”. “Administration does not see information as an organisational resource. Permission is needed to access ‘own’ information. Academic staff needs are not supported. Only SAPSE<sup>6</sup> needs are seen as important” (SAc, 2003). A senior academic reported that “My information needs are met for research. I ask the secretary for admin information such as pass rates, academic record of students, and contact information of a student. It would be great to have access to that sort of information and not have to go through an intermediary” (SAc, 2004). A senior academic stated that the information he needed and was unable to get was “institution wide indications of budget allocations”. Another stated that “Information tended to be scattered across the organisation”, and a Dean stated that he “could not obtain any student information beyond examination results”.

Information needs of staff are met by approaching the Data Unit where the Manager is responsive and organises the extraction of data when required. However, even so, the opinion was aired that the system did not support all requirements, and intermediation is required before users can get the information they need. Administrative needs of academics are not being met by the main administrative/ERP system, and more could be done in terms of knowledge sharing and dissemination through electronic media. Departmental budgets

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<sup>6</sup> Government statistics required (now called HEMIS data)

were still run in parallel (2x SAc, 2003). The fact that duplicate systems were being run by departments is an indicator that staff needs for information are not being met.

## C.10 Support for core value chain processes

### C.10.1 Support for core operations: Teaching and research

The diagram for the core operations is reproduced (Figure C-5 from Figure 6-9):

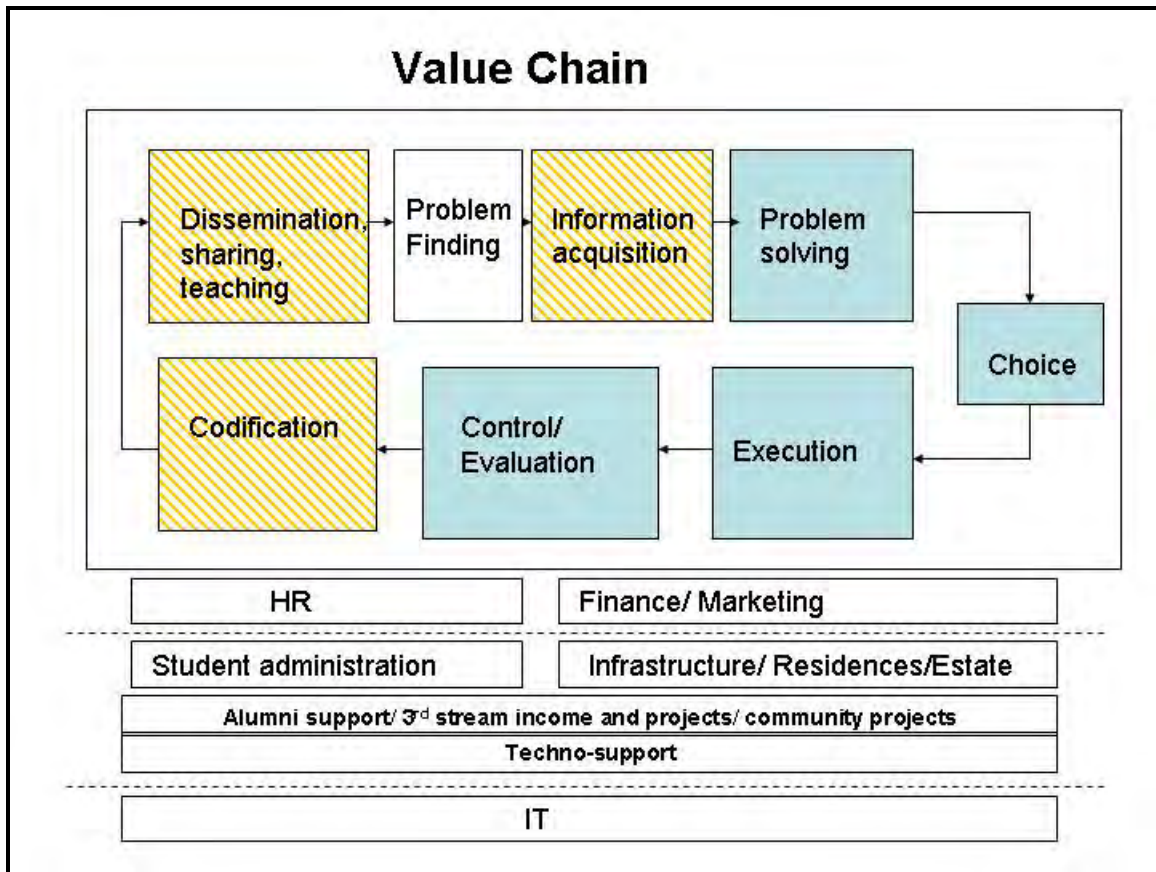


Figure C-5 Core value chain processes

The use of technology for teaching was not investigated per se, but the fact that there were lecture venues without adequate technology was mentioned by some respondents. A negative view in this respect was aired by a new staff member: “RU also has a tendency to save money. They do have to keep in the black but this should not be to the detriment of the

students” (Ac, 2003). Equipment is often out of order and it is difficult to track who is responsible for such equipment in a booked venue (SAc, 2005). As mentioned elsewhere, there is a roll-out plan to equip venues, but this is evidently not being communicated well enough.

Given the need to cater for greater diversity of students, as stated in the strategic objectives, the fact that there is not a greater emphasis on the use of eLearning is perhaps a gap.

#### ***C.10.1.1 Information acquisition***

The web is a rich source of information. The library provides targeted searches for researchers, and communicates the results electronically.

#### ***C.10.1.2 Codification***

Teaching material is not obviously available for sharing electronically, however, as mentioned, some departments are very proactive in this regard (Information Systems, for example), and the government initiative of a Quality Audit is forcing action in this respect.

#### ***C.10.1.3 Dissemination***

Research needs are supported by a web site that publishes the annual research reports, and provides useful information for researchers. It is a static site. There is no searchable database on research. For example, a query on “where can a thesis using an x research design be located” is not possible, (SAc, 2005). The Library is seen as being hugely successful in supporting research needs especially as far as its electronic databases are concerned.

As regards academic communication with students, departmental websites exist, but most have limited material published. Computer Science and Botany are two that allow student log in to access academic material. Most of the others have some published rules and regulations and links to useful sites only.



#### ***C.10.1.4 Control/evaluation***

Technology exists to assist with capture of multiple choice tests and the marking of these answers.

### ***C.11 Support for support functions***

An administrative staff member reiterated the issue of a lack of timely information and the lack of reporting structures that hampered information flow. However, the administration needs are generally well supported. The quality of information is generally viewed as good in terms of accuracy. It was stated that the financial systems were accurate and up-to-date and dependable and gave all the information required for decision-making in that position (SAd, 2003).

Direct usage of the administrative system (ERP) is limited. While most of the institution members who were interviewed agreed that the support they received from IS/ICT provision was excellent, many of the more senior members noted that they were not direct users of the services. They used (and were happy to use) intermediaries for their transactional needs (SAd, 2004), and many had secretaries who intercepted and printed their Email for referral. They were senior and felt that they did not “understand computers” (SAd, 2004).

By contrast, the need to rely on intermediaries to get information was mentioned as a problem by (possibly younger and more computer literate) administrative staff.

### ***C.12 Quality of IT management***

#### ***C.12.1 Structure and management***

##### ***C.12.1.1 Structure***

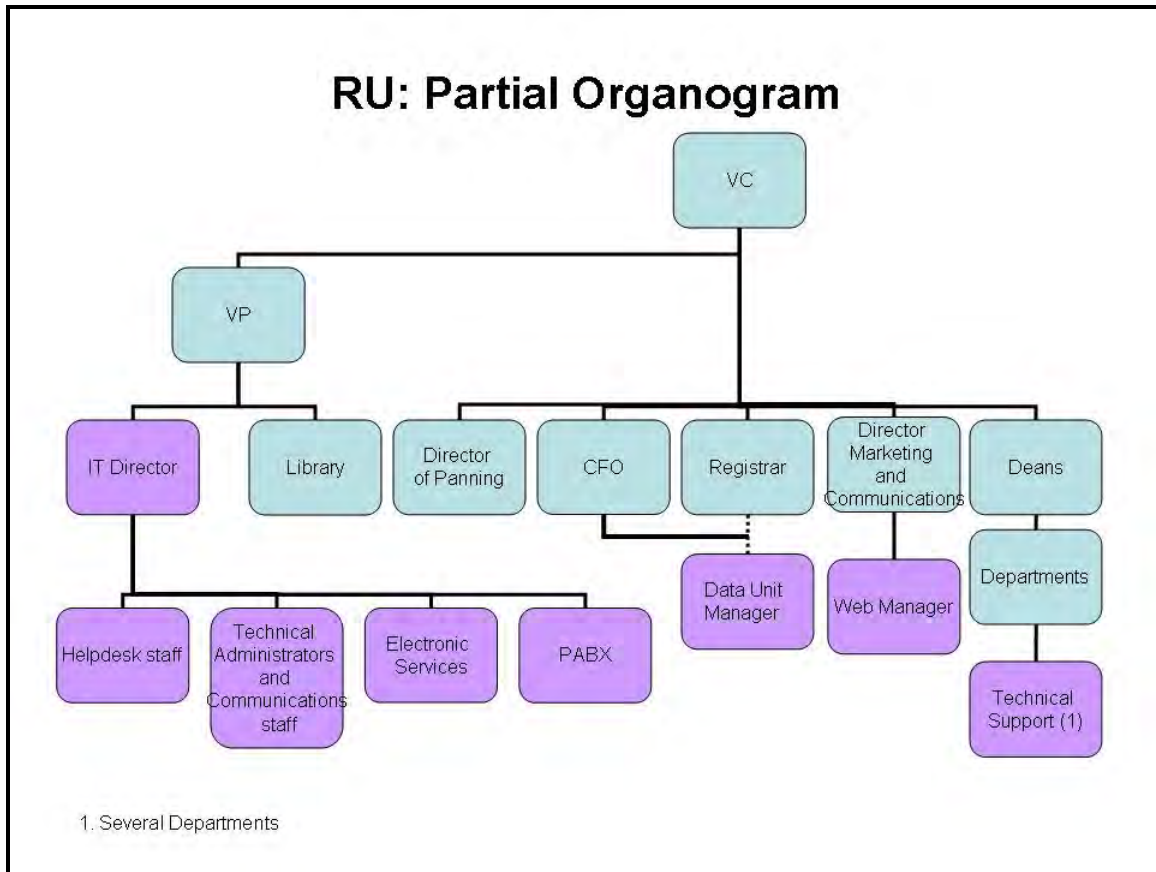
IT/IS seems somewhat strangely structured. The IT Director reports to the VP and manages the information technology, that is, the communications (networks and PAAB), mail-servers and web access as well as help desk and user support and common applications. They also maintain the public laboratories and servers, and are central in setting IT policy. What is

known as “Electronic Services”, that is, maintenance and repair of equipment, reports to the IT Director (ITMgm, 2003). The IT Division sets up policies for IT related issues, and has assumed a fair level of responsibility from users (but is constantly disappointed!).

The Data Unit Manager reports to the Financial Director, but works closely with the Registrar and manages the software development and maintenance of the administrative systems. The systems in use are a Higher Education management information system (HEMIS) which is a government requirement, and “Protea”, a home grown system for student administration that uses a Progress database.

A web unit exists and the manager is responsible for the intranet and web presence for RU and reports to the Director of Marketing and Communications (2004), and not the IT Director. However, the IT Director’s budget encompasses the Data Unit and the Web Unit. The Library’s IT budget is totally separate and the Chief Librarian reports to the VP.

A partial organogram relating to the IS/ICT functions and units is shown in Figure C-6:



**Figure C-6 RU - IT related organogram**

This reporting structure runs counter to the structure seen as ideal at larger HEIs where these functions would normally fall under a VP for Information Management. The fact that it works is attributable to good relations between the various managers, but can cause difficulties with strategic management and is risky as it is very dependent on personalities (SAc, 2005).

#### ***C.12.1.2 Staffing***

The IT Division is staffed by highly skilled employees, who are at least as eccentric as most IT people are reputed to be. They take pride in their work and form an elitist group. As mentioned earlier, they are well respected amongst their peers. However, there is a staff shortage, and the slowness of response to reported problems is attributed to this shortage

(ITMgm, 2004). This opinion is consistent with the concerns mentioned as a general South African HEI problem in the pilot study. Staff turnover is low, however.

### ***C.12.1.3 Budget***

One of the major problems experienced by the IT Division is budgeting. This is similar to problems experienced at other SA Universities. The percentage of the budget spent on IT seems low compared to other HEIs as far as it is possible to glean this information in a meaningful form. Competitive budgeting occurs where the IT Division competes with academic departments for computer resources. This becomes more of a problem when departments are given an IT budget and then request the IT Division (who has not been sufficiently kept in the loop) for support in installing equipment. This can cause project management problems.

The IT Division has generated funds (in-sourcing) through charging for usage and from an Eastern Cape University HEI library project (SEALS). It has managed to fund wiring of residences from these generated funds.

As far as departmental provisioning goes, the Computer Science and Information Systems Departments in particular have been very successful in raising external funds and persuading top administration to fund their equipment, and have state-of the-art equipment and specialised laboratories.

## **C.12.2 Management and governance**

### ***C.12.2.1 Service level agreements***

Service level agreements are not in place at present for internal service, but the SEALS Library project (a project linked to SABINET to allow for academic library collaboration and sharing of resources) for which the IT Division hosts the server, has a service level agreement in place.

### ***C.12.2.2 Committees and meetings***

Two committees in particular influence the management of IT:

The IT Steering Committee is a Senate subcommittee that provides advice on budgeting and technical issues. The Steering Committee was set up originally to act as a clearance for the budgetary request from the IT Division and has as members a variety of academic staff who have a stake in or knowledge of IS/ICT. The role has changed in recent years. They examine issues such as academic needs. They also review policies devised by the IT Director which are thereafter passed to Senate and Council for approval. A computer laboratory subcommittee exists to oversee all public and departmental laboratories, as well as a “pc” subcommittee to advise on what workstations to purchase (SAc, 2006).

The Teaching and Learning Technology Round Table (TLTRT) promotes the use of technology for support of the educational aspects of mixed mode delivery and learning.

The IT Division have a weekly management meeting attended by the Data Unit, while the support section meets daily. The IT Admin Review (IT Department, 2003) notes that ad hoc meetings are organised with departmental or support unit managers. How frequent these are is not clear.

### ***C.12.2.3 Policies***

A number of policies exist and are published to the web, inter alia:

- An acceptable usage policy
- Network monitoring and privacy
- Plagiarism
- User support policy
- Staff dialup/Email registration policy
- Telephone policies
- Policy on purchase of personal computers
- A wireless network policy.

These policies are passed by the IT Steering Committee and require Senate and Council approval.

#### ***C.12.2.4 Charge-out policy***

Students are charged a levy for computer usage. The amount depends on the level of usage – Computer Science students are charged more, for example. No bandwidth usage charge is levied, but students have a limit, which if reached leads to a diminishment of the speed of access.

#### ***C.12.2.5 Security and disaster recovery***

According to the “IT Admin Review” document, the following is stated: “a preliminary disaster recovery plan and procedures document is in place. This needs to be refined and completed and there will need to be structural and physical changes to aspects of the IT environment in order to implement this fully” (Rhodes University IT Admin Review, 2003).

Security is an ongoing issue, and the progress made is reflected in the next section under achievements. The fact that a disaster recovery plan exists is a measure of good management of the IT function.

### ***C.13 Quality of IT service***

#### ***C.13.1 Service quality***

The quality of the service provided by the IT Division was examined. The interviewees mostly stated their admiration for the work done by the IT Division and the support provided by the Data Unit. The view of staff and students at the operational levels can be gauged by the following survey:

The Servqual instrument was used as a basis for interviews and was also applied to a small group of staff and students for further clarification. Some staff in Administration and Academics at lower levels found that they wanted to divide the questionnaire into groups as some of the sections in the IT Division displayed different (less helpful) attitudes to others. However, the number of respondents was too low to allow for this differentiation. The average results are shown in the tables below. The instrument is constructed to allow for respondents to reply to “Ideal”, “Possible” and “Actual”. Table C-5 categorises responses by types of users for “Actual” service.

Respondents: 4 members of Senior Management, 2 Administrative staff (slightly more junior), 2 Senior IT managers, 3 Senior Academics and 1 Lecturer, and 2 Students.

Rating Scale: 1 to 7 where 1 = “Poor” and 7 = “Excellent”.

<b>Q2.4 ServQual</b>					
<b>Actual Service provided</b>	<b>User Category</b>				
	<b>IT</b>	<b>Student</b>	<b>Admin</b>	<b>Academic</b>	<b>Average</b>
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	5.0	3.5	4.4	5.0	4.3
Perform the service right the first time	5.0	4.5	4.8	4.8	4.7
Inform users when request can be completed	6.0	4.0	4.4	5.0	4.5
Inform users regularly about the status of users' requests	6.0	3.0	3.8	4.0	3.6
Provide services at the time they promise to do so	4.5	3.0	4.4	4.8	4.1
Average	5.3	3.6	4.4	4.7	4.2
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	4.0	5.5	4.8	5.0	5.1
Give prompt service to users	4.0	4.5	4.4	4.5	4.5
Always be willing to help users.	4.5	3.5	4.2	4.0	3.9
Never be too busy to respond the users' requests	3.5	2.0	3.8	4.3	3.4
Average	4.0	3.9	4.3	4.4	4.2
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	6.0	4.5	4.6	5.0	4.7
Be consistently courteous with users	5.0	3.5	5.6	5.0	4.7
Have the knowledge to answer users' questions	5.5	4.0	5.2	5.0	4.7
Average	5.5	4.0	5.1	5.0	4.7

Actual Service provided (ctd)	User Category				
	IT	Student	Admin	Academic	Average
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	5.0	5.0	4.8	4.8	4.9
Have employees who give you personal attention	5.0	4.5	4.8	4.3	4.5
Have the users' best interests at heart	6.0	4.5	5.6	4.5	4.9
Understand the specific needs of their users.	5.0	3.5	4.8	4.3	4.2
Average	5.3	4.4	5.0	4.4	4.6
Overall Average	5.0	4.0	4.7	4.6	4.4

**Table C-5 Servqual “Actual” Average for categories of users**

The responses on the whole are better than the mid-rating of 3.5. Only students have responded with some ratings at less than 3.5

Because the respondents judge what is possible, given resources, the difference between “Possible” and “Actual” is insightful, especially if the IT perceptions are compared to those of the users, and also highlights areas where resources are perceived to be low.

<b>Q2.4 ServQual</b>					
Possible service provided	User Category				
	IT	Student	Academic	Admin	Average
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	5.5	5.5	5.8	5.2	5.5
Perform the service right the first time	5.0	5.5	5.8	6.0	5.8
Inform users when request can be completed	6.0	5.0	6.0	5.4	5.5
Inform users regularly about the status of users' requests	6.5	5.5	5.8	5.8	5.7
Provide services at the time they promise to do so	5.0	5.5	5.5	6.0	5.7
Average	5.4	5.4	5.8	5.7	5.6



Possible service provided (ctd)	User Category				
	IT	Student	Academic	Admin	Average
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	5.5	6.5	5.0	5.8	5.8
Give prompt service to users	5.0	5.5	5.0	5.8	5.4
Always be willing to help users.	5.5	6.0	5.8	6.4	6.1
Never be too busy to respond the users' requests	4.5	4.5	4.8	5.0	4.8
Average	5.8	5.6	5.1	5.8	5.5
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	7.0	5.5	5.3	6.0	5.6
Be consistently courteous with users	6.0	5.5	5.8	6.2	5.8
Have the knowledge to answer users' questions	6.5	6.0	5.5	5.8	5.8
Average	6.7	5.7	5.5	6.0	5.7
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	5.5	5.5	4.8	6.0	5.4
Have employees who give you personal attention	5.0	4.5	5.0	6.0	5.2
Have the users' best interests at heart	6.5	5.0	6.0	6.4	5.8
Understand the specific needs of their users.	7.0	5.5	5.5	6.2	5.7
Average	5.8	5.1	5.3	6.2	5.5
Overall Average	5.9	5.5	5.4	5.9	5.6

**Table C-6 Servqual “Possible” Average for categories of users**

The overall average of “Possible” is 5.9 for IT and 5.6 for users. This is a fairly similar perception, and reasonably positive regarding the possibility of good service.

The gap between the actual and possible is shown in the next table, and provides insight into areas where communication/understanding gaps or indeed gaps in service delivery exist.

The score is derived by subtracting actual ratings from possible ratings for the two categories (IT and User).

<b>Q2.4 ServQual</b>		
<b>The Gap: Possible – Actual Service Provided</b>	<b>User category</b>	
	<b>IT</b>	<b>Users</b>
<b>Reliability: Excellent information services will</b>		
When promising to do something by a certain time, will do so	0.5	1.2
<b>Perform the service right the first time</b>	<b>0.0</b>	<b>1.1</b>
<b>Inform users when request can be completed</b>	<b>0.0</b>	<b>1.0</b>
<b>Inform users regularly about the status of users' requests</b>	<b>0.5</b>	<b>2.1</b>
<b>Provide services at the time they promise to do so</b>	<b>0.5</b>	<b>1.6</b>
<b>Average</b>	<b>0.3</b>	<b>1.4</b>
<b>Responsiveness: Excellent information services will</b>		
Have operation hours convenient to all their users	1.5	0.7
Give prompt service to users	1.0	1.0
<b>Always be willing to help users.</b>	<b>1.0</b>	<b>2.2</b>
Never be too busy to respond the users' requests	1.0	1.4
<b>Average</b>	<b>1.1</b>	<b>1.3</b>
<b>Assurance: Employees in excellent information services will</b>		
Instil confidence in users by their behaviour	1.0	0.9
Be consistently courteous with users	1.0	1.1
Have the knowledge to answer users' questions	1.0	1.0
<b>Average</b>	<b>1.0</b>	<b>1.0</b>
<b>Empathy: Excellent information systems employees will</b>		
Give users individual attention	0.5	0.6
Have employees who give you personal attention	0.0	0.7
Have the users' best interests at heart	0.5	0.9
Understand the specific needs of their users.	2.0	1.6
<b>Average</b>	<b>0.8</b>	<b>0.9</b>
<b>Overall Average</b>	<b>0.8</b>	<b>1.2</b>

**Table C-7 Servqual gap analysis “Possible” – “Actual”**

Issues with a difference of greater than 1 between the groups of respondents have been bold-typed

As could be expected, IT has a more positive view of the actual services rendered. IT's view is that the possible services are actually being delivered as shown by the gap index (0.8 overall). Users see the services as actually delivered lower (usually) than IT and the gap is larger especially in the "Reliability" category. In one case (bold-typed), users see the services more favourably than IT expects. Interestingly, the IT Division also often estimates what is possible higher than the customers (also bold-typed). Thus a communication or education gap exists. Users have some appreciation that their expectations cannot be fully met in reality, and their views on this gap are not hugely different from that of IT on average. (Note – as stated earlier, as with all the questionnaires, this was a very small sample of users, and it would be instructive to expand this survey more rigorously).

### **C.13.2 Helpdesk**

A helpdesk exists with a call centre assistant and a support consultant dealing with the first line of support. Helpdesk queries are passed to the consultant who attempts to resolve the problem immediately, but if this is not possible, the problem is entered on a tracking system and routed to consultants who contact the caller within 24 hours as the ideal. The IT Admin Review reports approximately 500 calls a month from staff members alone. Student and computer laboratory problems are dealt with by laboratory managers and student assistants. Staff shortages result in a continuous backlog of problems to be resolved. Email requests are also dealt with and a web tracking service exists.

### **C.14 Robustness of services and architecture**

The IT infrastructure is perceived to be reliable and well managed. Virus and spam management is good. Bandwidth management is well managed. The IT Division staff maintain that they cannot manage moral policing of sites visited and certainly at the time of interviews, no sites were blocked. Graphs are published of downtime and usage. "Big

Brother” software is used to track server performance and is available on the web, contributing to a culture of transparency.

## **C.15 Systems Portfolio**

### **C.15.1 System to support information needs**

#### **C.15.1.1 *Microsoft and open source***

The Microsoft academic license is used for office products. This is a Microsoft offering to HEIs by which the costs of the licenses for software are hugely reduced. Open source software is not used to any great degree, although some such software is used at server and network levels. An open-source public laboratory was opened in 2005(SAc, 2006).

#### **C.15.1.2 *ERP systems***

RU uses a tailor-made in-house system for its administrative needs, particularly for student administration processes. When questioned on this, the following was stated: “I believe it to have been the right decision. Many HEIs use ITS<sup>®</sup> but a lot of Universities have gone in-house using say Oracle to develop on, some use SAP and some use Banner A lot of those not on ITS<sup>®</sup> are re-developing their own, and a lot on ITS<sup>®</sup> are thinking of developing their own. ITS<sup>®</sup> is too rigid. Any request that comes can be met by us by writing the necessary software whereas those on ITS<sup>®</sup> need to wait for consultants to work with the system” (ITMgm, 2004).

The more “computer-literate” users stated that the administrative systems were extremely user-unfriendly, “Some basic information was primitive and the interface was a challenge – not user-friendly” (SAd, 2003). It was stated by most that the “Protea” home-grown system was not user-friendly since it was not GUI and this disempowered people by blocking access to information. This was repeated by several people. Intermediation to get information was required, and the helpfulness of particularly the Data Unit manager was excellent. However, the Data Unit manager made the point that although users wanted to access the systems themselves, this was dangerous as the data was complex, and they could land up with

incorrect results (ITMgm, 2004). A different view was that IT skills were seen as too low to use the systems properly (ITMgm, 2004).

Expert academic users stated that their access to query the system was limited, and found this annoying. Their information needs were not being met by the enterprise systems, and they had (had to have) departmental spreadsheets or systems to capture the finer nuances of their departmental and faculty needs. One of the Deans has written several systems that he has made available and this was seen as extremely useful, but were not part of the enterprise systems.

A questionnaire to assess how the enterprise information systems were viewed was administered. The results were positive on the whole and the following averages were achieved.

Respondents: 5 Senior Academics and 7 Senior Administrators. [Of these, only 3 administrators and 2 academics (Dean and HoD) used the home-grown “Protea” system].

Rating scale: 1 to 5 where 1 = “Poor” and 5 = “Excellent”.

<b>Q2.3 Use of the Enterprise System</b>			
<b>Issues</b>	<b>Category of user</b>		
	<b>Admin</b>	<b>Academic</b>	<b>User</b>
Does the system provide you with the precise information you need?	4.0	<b>2.0</b>	2.5
Does the information content meet your need?	4.0	2.5	2.9
Does the system provide reports that seem to be just about exactly what you need?	3.7	3.0	3.2
Does the system provide sufficient information?	4.0	<b>2.0</b>	2.5
Is the system accurate?	4.0	5.0	4.8
Are you satisfied with accuracy of the system?	3.7	5.0	4.7
Do you think the output is presented in a useful manner?	3.7	<b>2.0</b>	2.4
Is the information presented clearly?	3.7	2.5	2.8
Is the system user friendly?	3.3	<b>1.5</b>	<b>2.0</b>
Is the system easy to use?	3.3	<b>1.5</b>	<b>2.0</b>
Do you get the information you need on time?	4.0	3.5	3.6
Does the system provide up-to-date information?	4.0	4.0	4.0
Is the system robust?	4.0	5.0	4.7
Are the services always available?	4.0	3.0	3.3
Can you tailor the output to your needs?	3.0	<b>1.0</b>	<b>1.5</b>
Is it easy to get the exact information you need?	3.3	2.5	2.7
Overall Average	3.7	2.9	3.0

**Table C-8 Enterprise system supporting information needs**

As can be seen the general levels of satisfaction are fair, but with academic perceptions lagging those of administration. All scores below the mid-value of 2.5 have been bold-typed. In addition, academics approached at levels “lower” than HoDs did not reply to the ERP

questionnaire as they felt it did not apply to them, which points to the main institutional system not supporting their needs.

A newer GUI version of the Protea system, which was being evaluated at the time of interviews, has been purchased and is about to be installed (2005).

### ***C.15.1.3 Other systems***

Other systems are in use: A salaries system that is linked to the Protea system, an HR system that is “managed” by an external consultant, a VIP system (payroll), and of course academic departmental systems. The same questionnaire was applied for these systems and the average ratings were obtained from individual use of these systems:

- Academic (1 respondent) – home-grown system, 3.9
- VIP Salaries (2 users) – 3.7
- JEMgr (HR – 1 user) – 4.1
- HEMIS (Govt – 1 respondent) – 3.0
- HRExpert (1 respondent) – 4.3.

User satisfaction with these systems varies. JEMgr and the HR systems rank high in usefulness, although the data quality of the latter is suspect (IT Mgm, 2005). The academic system is rated at 3.9, where one would have expected a 5 rating as it is presumably written specifically for the needs of the department.

### **C.15.2 Portfolio completeness**

A tick list was used to check the portfolio of systems in place against the ideal systems. The main headings are averaged showing percentage provision of the systems listed.

Respondents: 2 IT managers and 1 senior administrator.

<b>Q2.1 Portfolio Comprehensiveness (Percentage)</b>			
<b>Category of systems</b>	<b>Yes</b>	<b>Planned</b>	<b>No</b>
Administration needs	84.3	13.4	2.1
Student Services	86.8	0.0	13.2
Administration services for students	73.1	12.0	14.7
Academic needs	85.7	14.3	0.0
Library Services	100.0	0.0	0.0
IT Management systems & web features and applications	90.0	0.0	10.0

**Table C-9 Portfolio of systems: Percentage completeness of provision**

As can be seen, the portfolio of systems seems more than adequate.

The area least covered is administrative services for students. There was some disagreement between the groups of users on completeness of the systems and application support. The main area of concern was regarding Academic support systems, and unfortunately, academics did not complete this questionnaire. One academic stated that the intranet was a major source of information, but academics stated that their needs were not being met.

## ***C.16 Quality of information***

### **C.16.1 Government**

Mention was made particularly of the need to “feed” the Government’s HEMIS system, and that RU had been congratulated on the accuracy thereof.

### **C.16.2 Executive management**

The VC stated that his information needs were met, but did not necessarily involve IT provided information: “Information is obtained internally and externally. Externally, this happens through meetings, conferences, reading and travel, and internally, by talking to people. I meet departments biannually to allow them to tell me what is exciting about what



they do. This helps me hugely. This works because we are small” and the “role of IT is particularly for providing the statistics for planning (although less so for the communication and face-to-face stuff). We have good information. All my information needs are being met, whether by IT or otherwise” (VC, 2003).

### **C.16.3 Academics, administration and tactical management**

The information needs of these groups were discussed in Section C.9.

### **C.16.4 Students**

An area of deficiency appears to be support systems for student societies: “The SRC’s information needs were not at all met by the system – the information was there sometimes but usually not accessible. The Dean had information, but it was unusable as for SRC purposes. I had to create ways for getting this. Mailing lists did not exist. The SRC report was created by putting information together – the student records kept information about lost DPs (“Duly Performed” records), but not whether you were on SRC for example. I did the analysis, for example in terms of transformation the representation of different groups on committees. The information was there, but I could get it only because I knew that it existed and could ask for it” (Stud, 2003).

Availability and fit-for-purpose of systems are less satisfactory as the student system is mainly tailored to suit the needs of the Registrar and not necessarily those of academic management or students. However, students are well served by a good student web “portal” (ROSS) where a discussion group exists, academic records and courses changes can be accessed, meals booked, and where student related material and information is published.

## **C.17 *Information behaviour: Information and technology*** ***“literacy”***

This section explores the levels of Information Literacy in RU, as this could well determine the need for technology support, as well as influence the level of usage.

Computer literacy is increasing, although senior management still work through intermediaries. On being asked which avenues would be used to prepare (for example) the

annual budget, the nine respondents interviewed (4 Academics and 5 Senior Administrators) indicated that they would use the systems, or ask other people for information or (not indicated) use their own information:

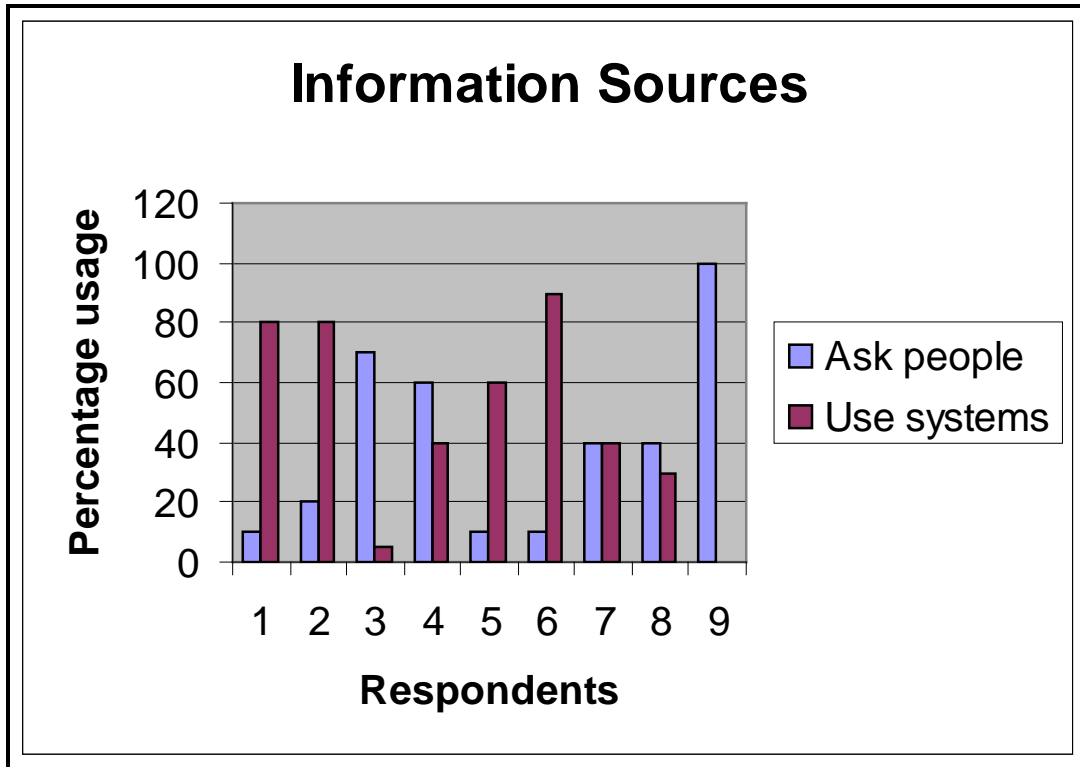


Figure C-7 Information Seeking and Usage

As can be seen, the use of systems varies widely, but it should arguably be higher than it is. This small sample supports the interviews that found that several senior managers use intermediaries for a significant proportion of their information needs.

This question was not repeated in the other case studies, but the RU responses are included here for greater insight.

#### C.17.1.1 *Literacy levels*

A perception survey was done in a broad brush assessment of computer literacy levels.

Table C-10 shows the average levels of literacy as estimated by the respondents for the various groupings of administrative staff, academic staff, and students. The question was “What is your estimation of the percentage of <category> literacy in the medium/system requested?” The responses were averaged and shown in Table C-10.

Respondents: 6 Administrative Staff, 5 Academic Staff, an IT Manager and 2 Students.

<b>Q3.1 Computer Literacy</b>		
<b>Category</b>	<b>Medium/System</b>	<b>Average</b>
Admin	Email	77.2
	Word-processing	74.8
	Spreadsheet use	54.7
	Administration system use	64.1
	Database queries	30.4
	Internal information seeking on the web	53.2
	External information seeking on the web	45.5
	Electronic library usage	21.8
Academic	Email	<b>86.5</b>
	Word-processing	<b>82.1</b>
	Spreadsheet use	58.3
	Administration system use	37.7
	Database queries	37.3
	Internal information seeking on the web	71.8
	External information seeking on the web	75.0
	Electronic library usage	69.5
Students	Email	<b>88.8</b>
	Word-processing	<b>81.7</b>
	Spreadsheet use	55.0
	Administration system use	30.0
	Database queries	19.4

	Internal information seeking on the web	69.9
	External information seeking on the web	81.3
	Electronic library usage	65.0

**Table C-10 Literacy levels by groups (2004)**

The literacy levels for IT enabled communication and information seeking appears good: areas that seem particularly high have been bold-typed. However, the fact that staff members have to use intermediaries to access information must be kept in mind.

**C.17.1.2 Media usage**

The same set of respondents was asked to estimate the importance of electronic media in work related communication: “What percentage of your work related communication with employee categories within the organisation is based on the various media?” (The scores do not add up to 100% per category as user responses were averaged per medium. Scores are rounded up).

Respondents: 6 Administrative Staff, 5 Academic Staff, an IT Manager and 2 Students.

<b>Q3.2 Media Usage</b>		
<b>Group</b>	<b>Media</b>	<b>Average %</b>
Admin	Email	41
	Telephone	37
	Cell phone	12
	Fax	17
	Written communications	30
	Personal contact	45
	Meetings/ conferences	29
	Web	11
Academic	Email	53
	Telephone	28

	Cell phone	12
	Fax	15
	Written communications	28
	Personal contact	41
	Meetings/ conferences	37
	Web	11
Students	Email	39
	Telephone	15
	Cell phone	38
	Fax	16
	Written communications	30
	Personal contact	45
	Meetings/ conferences	25
	Web	16

**Table C-11 Media Usage for communication**

This table shows the importance of email as well as personal contact as the most used ways of communicating.

### ***C.17.1.3 Media effectiveness/responsiveness***

The responsiveness or effectiveness of communication by media category was assessed with the same respondents. The question asked was, “What percentage of response do you get when communicating with the following categories and using the following media?”. The response rates (what percentage of messages left on this type of media is returned or acknowledged) is shown in Table C-12:

Respondents: 6 Administrative Staff, 5 Academic Staff, an IT Manager and 2 Students.

<b>Q3.3 Media Responsiveness/ Effectiveness</b>		
<b>Group</b>	<b>Media</b>	<b>Average %</b>
Admin	Email	84.6
	Cell-phone voice-mail	49.3
	Written	75.8
Academic	Email	85.3
	Cell-phone voice-mail	62.9
	Written	72.7
Students	Email	80.0
	Cell phone voicemail	49.4
	Written	57.1

**Table C-12 Responsiveness: effectiveness**

Again, email was seen as the most effective/responsive of the media (office voice mail was not provided).

***C.17.1.4 Media efficiency***

When asked how prompt the replies were on average in the different categories, the following results were obtained and translated into percentage of the maximum of the rating scale (5) in Table C-13.

Respondents: 6 Administrative Staff, 5 Academic Staff, an IT Manager and 2 Students.

Rating scale: 1 to 5 where 1 = “Poor” and 5 = “Excellent”.

<b>Q3.4 Media efficiency/promptness</b>			
<b>Category</b>	<b>Medium</b>	<b>Rating</b>	<b>Average %</b>
Admin	Email	3.5	70
	Cell phone voicemail	2.6	52
	Written	3.2	64
Academic	Email	4.1	82
	Cell phone voicemail	3.4	68
	Written	3.4	68
Students	Email	3.3	66
	Cell phone voicemail	3.1	62
	Written	2.7	54

**Table C-13 Media efficiency/promptness**

This table shows levels of response as less good, but with email still regarded as the most efficient.

All these literacy and media ratings can only be significant when compared with other HEIs, but in general the levels can be estimated to be satisfactory for media usage and behaviour.

### ***C.18 Transformation alignment***

Although “transformation” could be dealt with under strategic issues, because of the focus of the report it is dealt with separately. Mergers have forced a transformation of the higher education scene in South Africa, and the stated purpose of these enforced mergers is to “transform the educational landscape”. The role of IT and its impact is discussed.

## **C.18.1 Transformation**

### ***C.18.1.1 Mergers: divestiture***

From an administrative point of view, the divestiture of the city campus did not have a major impact on the mother campus, as the two campuses had been handled as separate entities. The only impact on RU was that its demographic profile suddenly became “whiter” as the satellite campus had had a more representative demographic profile. Thus, this divestiture constituted change, but not major change or transformation.

### ***C.18.1.2 Merger/ divestiture and data impact***

The shedding of the East London campus was not difficult from a system’s point of view in that all East London students were coded with a distinguishing prefix. What has caused problems, however, is that East London students were allowed (as a special dispensation) to remain RU students if they had registered before 2003 – the so-called pipeline students, and those that registered in 2003 were treated as joint students while those registering after 2003 were then seen as students of the new merged University. The subsidy and fees would go to Fort Hare University, but the degree and student records would be awarded and held by RU. The difficulty with this is that RU still needs to keep the course history of the pipeline students, while their class marks and examination marks are captured on the Fort Hare system, which is not compatible with the RU system. Ways of calculating final marks are also governed by different rules. This has caused problems in students’ marks and has been an area of major concern for students.

### ***C.18.1.3 IT support – multiculturalism***

No specific support for multi-culturalism exists, apart from student discussion groups on the web which allow for different “voices” to be heard.



#### ***C.18.1.4 IT support for community projects and third stream funding***

The use of IT for community projects was not mentioned specifically, but accounting for these projects as well as third stream income has not been mentioned as problematic. This question was not specifically asked.

### **C.18.2 Communication Management**

This section overlaps with earlier discussion on information behaviour and tacit knowledge management. The Marketing and Communications Division is in charge of internal and external communications, but there has been no joint strategic planning with IT to exploit IS/ICT fully. Indeed at one stage the Division hired staff to set up their own databases (particularly for fundraising and alumni). This practice was discontinued after misgivings were raised by the steering committee. The support of IS/ICT for communications is mainly evinced in email, intranet and possibly videoconferencing.

#### ***C.18.2.1 Email***

On being asked how IT has impacted on processes and behaviour at RU, most agreed that changes had been dramatic, mainly in the area of communications especially with regard to the use of email. When asked what the most important system was at the University for their work, most people interviewed named email. Management of email is thus a major concern, and is on the whole, in the author's view, very well managed at RU. Interestingly, a graph has been provided by the IT Division showing the amount of filtering that is being done on email– at times the volume of spam is more than the volume of legitimate incoming mail (IT Mgm, 2004). Email provision is very stable, but an incident occurred where stored email was destroyed (2004). This was a major catastrophe as email is used as a repository of formal (KM) and of course informal communications, and serves as a trail of conversations and decisions for staff members. It highlighted the “emergent” dependence and importance of email at all levels.

Email overload was mentioned as something that needs management. Mailing lists have been set up for targeted mail: “TopList, Eventslist, and HoDlist” that allow for less mail

overload. Staff members can subscribe or unsubscribe to these moderated lists. Thus the overload is managed to some extent.

### ***C.18.2.2 Intranet***

The web site is another communication tool. It is often used merely as a broadcasting medium, but the student web site is well developed, and the student discussion group on the web is used by senior staff to keep abreast of issues that are of importance to students. This underscores the point made that senior management are more aware of student needs than junior staff needs.

When questioned about the role of the web site, the following was said by IT Management:

“IT creates and maintains the web presence of RU.

IT sets up policies regarding what can be on the web but this is difficult because academics do not want any restrictions on anything. It is easier now because of the laws regarding information that can or must be published and everyone has to abide by that. The University or departments are liable for incorrect information (disclaimers do not serve a purpose any longer). We recommend that people always maintain a link to official information. So we now give guidance as to where they can get into trouble.

The calendar has been on the web for quite some years in pdf format, but now in html.

Every now and again there is a flurry of interest in the web, with people asking what is happening and that it is not good enough, but they have no clue what it should be doing. People tend to say ‘I don't want to know about the web and I don't need to know about the web - it has not been part of my job and it is not now’. When departments send stuff to be printed, that material should also be published on the Web. But this should not be driven by us. No portal software is being used except to authenticate users for internal information” (ITMgm, 2003).

### ***C.18.2.3 Videoconferencing***

Videoconferencing sites are available, and were used when RU still had two campuses, one in Grahamstown and one in East London. Since the mergers of HEIs, the East London campus has been incorporated into the University of Fort Hare and so this need for video conferencing for internal management has diminished.

### C.18.3 Knowledge management

No explicit knowledge management strategies are in place in terms of capturing or sharing of processes, procedures and individual know-how with the use of IS/ICT. Some lecturing material is shared as discussed previously, and some departments (for example the Information Systems Department) actively promote the publishing of all learning material on their departmental server. This includes learning objectives, slides, notes, readings, and a test bank with model answers amongst others. The HEQC Quality Audit may focus more attention on the capturing of this type of content for sharing and transparency in the pursuit of better teaching practices. However, because of the culture of the organisation, informal knowledge management is in place in the sense that individuals are in the main very helpful to junior staff in order to improve their performance. Mentoring of junior academic staff is a norm as is sharing of lecturing material, and processes are in place to support new staff members.

A questionnaire (Q4.2) was used to measure knowledge behaviour. (Q4.1, see Appendix E, was also presented to respondents, but respondents stated that they did not have the technical ability to answer the questions. The questionnaire was abandoned in favour of Q4.2 and the interviews). Table C-14 captures the responses in aggregate form.

Respondents: 2 Students, 5 Academics, 3 Senior Administrators and 2 IT Managers

Rating scale: 1 to 5 where 1 = “Poor or non-existent”, and 5 = “Excellent or well-supported”.

<b>Q4.2 Knowledge Management/ Information behaviour</b>					
<b>Behaviours</b>	<b>User Category</b>				
	<b>Stud</b>	<b>Ac</b>	<b>Ad</b>	<b>IT</b>	<b>Ave</b>
An electronic knowledge base exists to store new ideas, knowledge, solutions, and best solutions.	1.5	2.8	3.5	1.5	2.3
Documents are proactively shared with employees.	3.0	3.2	3.3	2.5	3
The development of job documentation is encouraged.	4.0	3.2	4	1.5	3.2
Information from many sources is stored in an (integrated manner) and cross-referenced, facilitating better communication and decision making.	1.0	2.6	3.3	3.0	2.5

<b>Behaviours (ctd)</b>	<b>User Category</b>				
	<b>Stud</b>	<b>Ac</b>	<b>Ad</b>	<b>IT</b>	<b>Ave</b>
No policies or technical security issues prevent the sharing of information and knowledge.	3.0	2.5	3	4.5	3.3
Documents can be posted on an organisational (intranet) portal or saved on a network server.	4.5	4.0	4.0	5.0	4.4
Proactive as members actively seek out and respond to changes in their competitive environment and think about how to use this information to enhance existing and create new products and services.	2.5	2.8	2.7	3.5	2.9
Information is transparent as members trust each other enough to talk about failures, errors and mistakes in an open and constructive manner and without fear of unfair repercussions.	3.0	2.6	3.3	4.0	3.2
Incentives are in place that motivate staff to share knowledge.	2.0	2.0	1.7	3.0	2.2
The generation of new ideas and knowledge is highly valued.	3.5	4.2	3.7	3.5	3.7
The information and knowledge you receive is accurate and up-to-date.	3.5	4.0	4.0	4.5	4.0
An organisational intranet portal exists where information and knowledge relevant to job requirements may be retrieved.	4.0	3.0	3.3	3.5	3.5
It is common practice to store work documents on an organisational server, rather than on personal computers.	2.0	2.4	2.7	2.0	2.3
Electronic and/or non-electronic collaboration, teamwork, and cooperation are a part of doing business.	3.5	3.6	4.0	3.5	3.7
Information is stored and organised in a way that makes it (intuitively) easy and quick to locate.	2.5	2.4	4.0	2.0	2.7
Advanced technologies, (such as data warehousing, mining, and modelling), are used to leverage data and information for strategic and operational decision making.	2.5	2.2	3.0	1.0	2.2
Documents stored on an organisational server or intranet contain timely and useful knowledge for our job responsibilities.	3.0	2.6	3.0	2.5	2.8
Expert systems and knowledge bases are used to aid in decision making.	2.0	3.2	3.3	2.0	2.6
Average	2.8	3.0	3.3	2.9	3.0

**Table C-14 Knowledge Management/ Information behaviour**

This gives a positive view of the organisation with an overall average greater than the 2.5 midpoint.

The pattern is, however, consistent in that Administration is more positive on the whole than Academics and Students. IT by contrast is more pessimistic (realistic?).

As far as technology support is concerned, knowledge management and communication management are often supported by document management and intranet/web sites and portals. Document management was being investigated at the time of the interviews. Intranets will be discussed further under Communications Management. The library is, of course, a prime example of KM with the advent of eLibraries. The service and provision for access to information by the Library is excellent.

Document management is being considered, but not implemented at the time of writing. Intellectual Property (IP) issues are not considered strategically important. One senior administrator quoted the example of administrators in HEIs in the USA stating that the economic value of IP was not seen as significant (SAd, 2004). This counters the statistic quoted in Chapter two on the impact of patents on innovations.

The issue of multiculturalism is not being catered for sufficiently. The web could be a powerful medium for allowing discussion groups of the minority groups – both linguistically as well as for junior staff members. The student web discussion group is being used by top management, however, as already reported, to stay in touch with issues of concern to students.

## ***C.19 In summary***

### **C.19.1 Context analysis**

Using Porter's "5 Competitive Forces", RU shows strengths in its management of the "buyers" of its products – the students: "Of the students who graduated in 2005 (that is, completed in 2004), only 7% of 1st time graduates and 1% of postgraduates indicated that they were still seeking employment in April 2005 when the survey was done.

The other respondents either had gained employment (full/part-time), or were studying further, or were doing things like a gap year” (SAd, 2006). RU maintains strong relationships with industry through its alumni network who form part of the “Buyer” category.

As regards “Suppliers” or suppliers of new students, its reputation makes this a comfortable area: it competes with “Rival Firms”, mainly with Stellenbosch and UCT in the Eastern Cape, for traditional Model C students. However, its residential system is a big draw-card. This is reasonably unique in SA, and students from Gauteng and other areas in SA are attracted by this.

Private institutions could be viewed as offering “Substitute Products”. However, institutions like Damelin and C College (non-traditional institutions offering degree courses), successful as they are, are still competing against the reputation of RU.

“Barriers to Entry” are less high for the areas where there is a great deal of growth – Commerce, while for Science the costs are high, thus there is a great deal of competition in the area of Commerce, and the larger city-based centres may have a competitive edge in this respect, with a large pool of working and mature students. In addition, the opportunities for consulting for staff in larger centres may make it easier to retain staff in these disciplines at other HEIs. However, RU has a few niche areas – Pharmacy and Journalism were unique for English-medium Universities, thus creating a captive market (this may change because of the HEI amalgamations, and the historically Afrikaans Universities becoming largely dual medium and offering some of these niche courses).

RU, while meeting the national strictures for transformation, is changing slowly. It cannot increase dramatically in size because of the logistical restrictions – the term “controlled growth” is used; it has an excellent reputation and does not see the need for a large number of new programmes; and it is committed to the departmental structure that has worked well in the past.

Mixed messages exist for how successful RU is in transforming or changing: on the one hand, it is stated, as described earlier, that RU is changing, but slowly (and perhaps reluctantly). The rate of change seems to be slow: opinions especially from academics

seemed to be less positive regarding the rate of change. The slow rate of change can also be viewed negatively: “Nothing much is happening regarding real transformation. There is, however, a conscious attempt to look at what we do and to look at inequalities and to adopt an African perspective” (SAC, 2004). The comment was made that changes to established traditions were difficult to make. Other comments from interviews were that the cry of “standards” was raised “which often masked prejudice and lack of desire for change”. “RU bought into some, but not all, government policies. Structures to support government policies were set up, but not supported in the spirit of total buy-in”. “Rhodes was still a sexist university, but was sensitive to race issues – more so than possibly other universities”. On the other hand, the questionnaire results (Table C-2) for success of strategic objectives is generally rated medium to very positive. The difference may be found in the level of responses – more positive from administration and top management than lecturing staff, and points to the different perspectives of the groups. It can thus be viewed as transforming/changing according to its stated objectives and with internally perceived and measurable success particularly in crucial areas, albeit slowly<sup>7</sup>.

RU is largely united in having a common vision and goals and values that seem to permeate the whole organisation. This is more apparent at senior than at junior levels. There appears to be some disjuncture between perceptions and opinions of top management and senior academics, and other levels of academics. This “closeness” allows the strategies to permeate more easily through the organisation.

What remained for RU was to meet other government requirements, for example demographic representation. A problem RU faces is that in the eyes of the previously disadvantaged communities in the area, it is seen as elitist and not involved in the needs of the region. This is often mentioned and echoes an “ivory-tower” image. Even internally, an issue mentioned by one of the interviewees (a newer senior academic) was that RU was not

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<sup>7</sup> A new VC has been selected (Daily Dispatch, 8 October 2005) who has stated that he wishes to create “more opportunities for blacks and women” implying more “scholarships, effective mentoring and appropriate induction and support....”

“doing enough to acknowledge its geographic context in the Eastern Cape” in its outreach to the community (SAC, 2004). This is recognised by management: “We ARE being criticised for being too slow in meeting society’s needs in terms of servicing the Eastern Cape and the Eastern Cape government” (SAd, 2004).

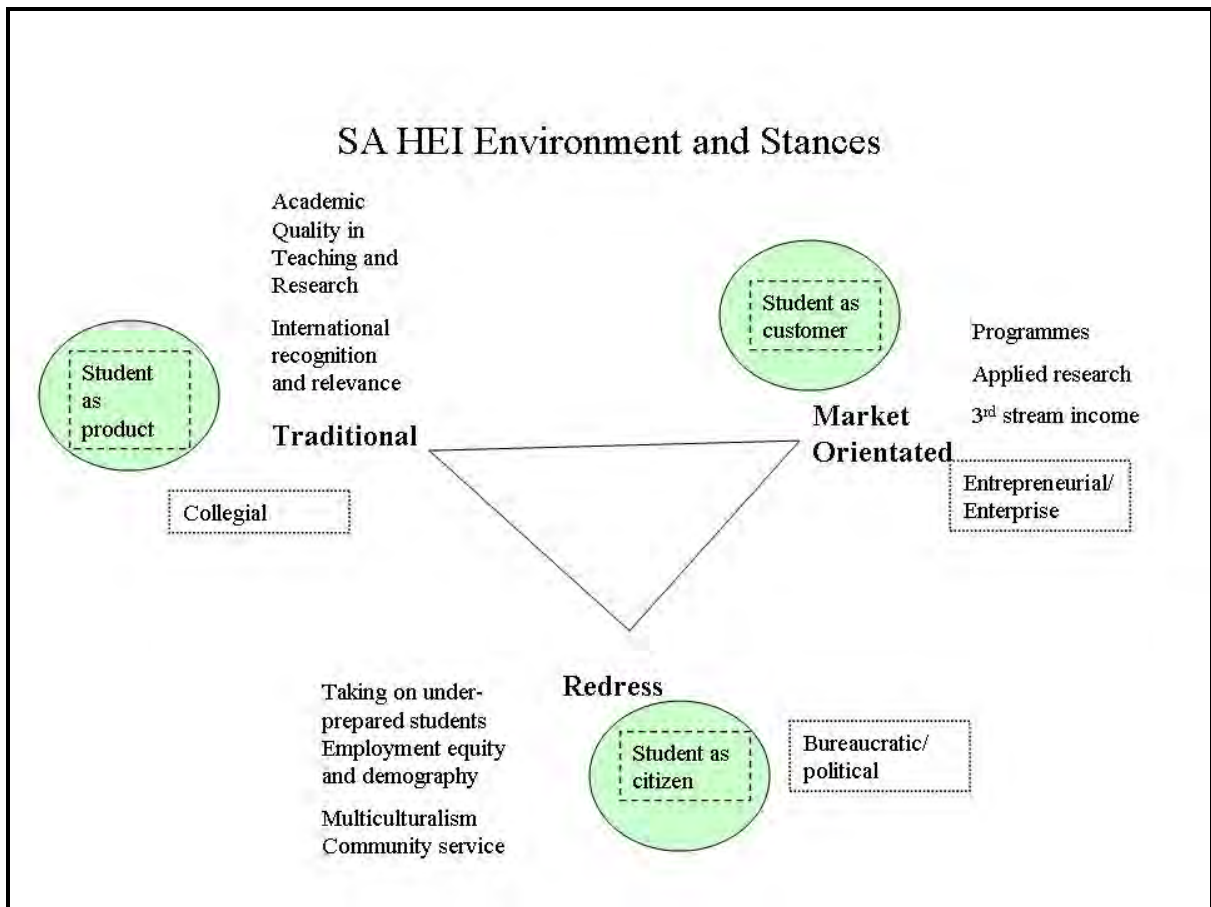


Figure C-8 Balancing competing drives - Roets (2005) – reproduced

If the issues depicted in the adaptation of Fourie and Fourie’s (2001) diagram (Figure C-8 reproduced above) are considered, RU tilts towards “Collegial” while State regulations for “Redress” are being met. Community Service exists, but not markedly more so than before, and multiculturalism does not appear in discussion as a major concern. RU is not overtly entrepreneurial.



Its processes are effective and some are perceived as efficient (with the Registrar's Division as a quoted example), although there are grumblings about slow HR processes in particular.

### **C.19.2 IS/ICT importance**

Despite the stated importance of IT, its strategic level is fairly low. Of concern is that the importance of IS/ICT is not greater. IT falls into the lower left quadrant of McFarlan and McKenney's grid, and this is exemplified by low budget percentages and the need for the IT Division to in-source for projects. Again, probably because of the reporting lines, no driver is visible to move IT into a more strategic position. The reporting lines are not what are quoted as ideal, in research writings, where all the information functions should be consolidated and report at the highest level – a VP of Information, for example.

### **C.19.3 Strategic**

Alignment maturity of IT support for organisational strategic management is estimated as a stage 3 level of maturity (see Table C-3). Management have a positive view of communications between IT and management, as well as the partnership between them (more so than IT that have some negative views – ratings of 1 in this latter category), while IT feels "Governance" is at a satisfactory maturity level.

The strategic alignment is not high at 3, but given the level of importance of IT for the institution, this in itself is not a concern. If the value of IT were to move into the top quadrants of McFarlane and McKenney's grid, then this alignment would be unsatisfactory. The fact that SIPM is of low formality and that most of the senior respondents stated that IT supported RU's strategic needs admirably is interesting. A relationship appears to exist between level of importance and level of required formality of SIPM.

Although the SIPM is effective and flexible, it could be improved upon by being more formal. The flexibility is related to the close interaction between the senior consumers of the services and the IT staff. Furthermore, it would be wise to address the different perceptions between management and IT of the effectiveness of communication and partnership between the two groups.

#### **C.19.4 Tactical**

User and IT perceptions about the actual service delivered by the IT Division differ slightly (4.4 and 5 out of a possible 7 – see Table C-5). There are areas where the perception of delivery diverges (and these areas need attention either from a service delivery perspective or from a communication perspective), but on the whole the perception of IT service given resources is good.

The architecture appears robust, and the systems providing for HEIs needs are relatively complete. The portfolio survey shows a high level of completeness of systems (86.7% overall – see Table C-1) to provide for the organisational needs, despite some disagreement from academics. The “enterprise system” can and does provide for the information needs of the organisation. However, access to it is limited particularly due to the perceived user-unfriendliness of the system, and intermediation is required. Academics rate the usefulness at less than average (2.4 out of a possible 5 rating), while administrators rate this at 3.8 (see Table C-8). The conclusion reached here is that the systems are more geared to support functional support units than academic management. This is particularly evident in the Registrar’s Division, where the processes have been so improved with IS/ICT support as to “provide a competitive edge” for the University. The use of technology for other support units is not obvious. The use of videoconferencing for interviews is not widely (if at all) used. The HR processes themselves are still being criticised, and IS/ICT could provide efficiency and effectiveness support measures. Security on the campus is a concern, and IT is being investigated to manage crime-prevention, for example, through the use of problem-reporting stations (SAd, 2004).

The unique managerial structure/mix of HEIs is not particularly well served electronically. Decision-making by committee is slow, and minutes of meetings are not available electronically to speed this up (and save trees). The information for committee meetings is not tailored for individuals to use it effectively.

However, the information systems are flexible because of being customised in-house, and because of the pro-activeness of the Data Unit. This should arguably allow for rapid

responses, once decisions have been made, and thus support is possible for a more flexible structure and devolved decision-making.

### **C.19.5 Operational**

Hardware provision (open laboratories) is good in comparison with other institutions, as per the author's survey (2003, Appendix A). Computer technology for teaching is not managed effectively, although the facilities are good where they exist, and roll-out is planned for the under-resourced lecture and seminar rooms. The residences are wired and although this may have some negative consequences such as anti-socialism, the facilities to work from places other than the open laboratories exist.

Academic needs and student society needs for systems and information are perceived to be inadequately met. Capturing of course material is not generally practised. In terms of teaching, it is up to individual departments to publish material for students, and this is not done uniformly. The web is used by a few Departments in this respect.

In terms of research, the web publishes useful static information, but no real knowledge sharing is facilitated.

Community projects and consultancy also publishes material which is static.

### **C.19.6 Information behaviour**

Information/computer literacy is judged high for the University community - 83% for email and 78% for word-processing (averaged across the categories). It would be expected that usage of computer technology be higher than that quoted for media usage (Email – 41%, 53% and 39% - Table C-11). When electronic media are used for communications, the effectiveness (judged by response rate) is good, especially for email (83% response rate across categories), and the efficiency is slightly less, but still judged at 72% efficiency estimated from speed of responses. The information intelligence levels as epitomised by computer literacy and media usage appear to be high, but this can only be judged in comparison with other institutions.

### **C.19.7 Knowledge and Communication Management**

Knowledge Management and Communication Management at the strategic level are neglected. IS/ICT support for explicit KM, such as IP management does not exist, nor for other knowledge creation, sharing and dissemination (as discussed under teaching support). The institution as a whole rates a 3.0 for KM (out of a possible rating of 5 in terms of the questionnaire in Table C-14).

In terms of communication, email is seen as vital, and is generally a robust form of communication. Student portals do not exist. Student communication, however, appears well served with electronic discussion groups and the ROSS system. Little evidence exists of communication support for new staff members, and members of minority groups. Tacit knowledge management is not being examined for value.

### **C.19.8 Transformation**

The University is seen as changing rather than transforming (since the scale of change is low). The loss of the city campus posed some data and information problems, mainly because of the “pipeline” students whose records are still held by RU, but processed at the University of Fort Hare (UFH). The rules regarding, for example, aggregation of marks, are different and this has caused problems. However, these are not related to IS/ICT, but the blend of different processes. The University is not embarking on any new ventures that require an entrepreneurial fast-moving style, and thus, as regards transformation/change, IT’s role is muted. In any case, the enterprise system is flexible by being an in-house system and easily adapted, thus supporting change.

Where there appears to be a lack is in the possible use of IS/ICT, particularly the web, in supporting cultural diversity management and communications - this has not been exploited sufficiently.

## **C.20 Exploratory areas**

Six other areas were explored amongst respondents: IT leadership and areas of innovation and leading practice (as opposed to “best practice”), cybernetic loops, process reengineering and the IT ramifications thereof, issues specific to South Africa that could influence support offered by IT, as well as achievements that could serve as blueprints for IS/ICT and HEIs, and IT support specifically for change.

### **C.20.1 IT leadership**

The IT leadership is focused on hardware and communication technology. New uses of technology are not actively explored – they may “emerge” from educated/interested users. The view of the IT Director was that the IT Division was not expert at the core operations of RU. The IT Director says that he cannot advise on academic matters, for example, eLearning, as education is not his field, but that he is happy if staff approach him once they know what they want to do. More leadership could be given for IT exploitation, but the strange reporting structures are not conducive to dealing with the communication gap. This may also contribute to the importance level of the IT function in RU. The IT Director saw the role of the IT Division as that of providing as robust and flexible an infrastructure and service as possible to allow for flexible (emergent) uses thereof as the need arose. Leadership in terms of introducing new infrastructural technology therefore existed, but not necessarily new application technology. “IT should not be the driver of strategy for the University” (ITMgm, 2004). “IT is doing a good job promoting and supporting what is required for RU” (SAd, 2004), but voices the accepted (and perhaps by now outdated) wisdom that generally, “IT has been known to drive the business and that is not correct – the driver should be people. IT is only a servant”.

The IT Director has shown leadership in the generation of extra funding for projects that would normally not be managed within the normal budget.

However, given the strange reporting line, there appears to be a gap where innovation and leadership should be shown in terms of knowledge management, communication management and use of new technology. This is an area that could be improved.

### **C.20.2 Feedback loop**

The use of IS/ICT as a cybernetic control loop for certain academics such as tracking of decisions, and implementation thereof, is not being used.

### **C.20.3 Process reengineering**

IT has been used for major process engineering in the Registrar's office, to the extent that the systems have been identified as giving RU a "competitive edge". The Registrar, some years back, made a bold attempt to consolidate functions through the use of IT to provide a "one-stop shop" for students. Although this caused some *frissons* amongst the traditionalists and, of course, had some problems, it was a successful venture. An excellent relationship exists between the Registrar and the Data Unit. Some of the technology solutions introduced have been developed by the Registrar's office through the advanced use of, for example, the Office Suite of products. The Registrar has served as a champion for process reform. Other support units have not had such champions in order to examine their processes in the light of what technology can do for them. The question arises whether this is the role of the support units or the role of IS/ICT management? - Given the present structure, there is a gap.

### **C.20.4 South Africa**

The IS/ICT issues affecting South Africa, identified in previous chapters such as retention of skills, bandwidth and lack of "sufficient" budget affect RU, but these problems are managed. One issue where a positive step has been made is in the "in-sourcing" of services, allowing the IT Division to generate extra funding. Bandwidth management is also good and enables the academic staff and students to use this maximally to support the core functions of the University.

### **C.20.5 Achievements**

For IT, the IT Admin Review (2003) notes achievements as amongst the following:

“Web unit establishment; improved hardware reliability, network stability is good; vulnerability of the network has been reduced by redundancy of routes; a disaster recover plan is being refined; network security is ongoing (“200 probes per hour – no major security incidents for more than 3 years”); the SEALS library project has been a success; quota control of Internet bandwidth usage is successful; and general policy documents have been produced”.

These claims appear justified to the author.

### **C.20.6 IT support for change**

Respondents, when questioned on the role of IT in supporting change, voiced the opinion that IT could only support the information needs of RU. *Per se* it did not have a major (strategic) role in transformation.

This opinion disregards the possibilities offered by IS/ICT to support different communication styles, to give voice on the web site, for example, to different opinions from minority groups, and for encouraging a new way of communicating that removes the first impulse of racial or cultural stereotyping. This view is supported by the following comment: “The web is sort of transforming the university. It is a tool that is a kind of leveller I suppose in that people have the same access to information” (WebMgm, 2003).

The role of IT in “transformation” in terms of Government requirements is low. The HEMIS system’s requirements for good data are very well met by the systems in existence. Some systems have been created for the changes occurring: “We have written some systems specifically related to a changing “...context. “There is much more crime on campus and systems are written to try to combat this, for example by using a ‘Dallas chip’ access and tracking system, and tracking of disciplinary proceedings” (ITMgm, 2004).

As regards responsiveness and flexibility, the systems in use were contrasted with, for example, the ITS<sup>®</sup> HEI packaged system, and it was stated that they allowed for much greater flexibility: “Q: If you are in a state of transformation you want to respond quickly,

but ITS<sup>®</sup> does not allow you to do so? A: Correct. ITS<sup>®</sup> is too rigid. Any request that comes can be met by us by writing the necessary software whereas those on ITS<sup>®</sup> need to wait for consultants to work with the system and the system changes need to be reflected for all users” (ITMgm, 2004). However, intermediation was required for obtaining information.

### **C.21 Conclusion**

The IS/ICT service is generally seen as effective and efficient (and in some areas excellent) although some perception and communication gaps between users and IT are obvious, and strategic management areas are not covered. The actual provision of systems for use is also seen as excellent for administrative use, less so for academic staff use, and less so for student use. Some of the proposed antecedent factors are in place for successful transformation, and the areas where there are gaps have been highlighted.

The next chapter examines a different, but in some ways comparable, institution. Chapters eight and nine compare all the institutions and relates the findings to the proposed model.



## **Appendix D Case Study of the University of Fort Hare**

### ***D.1 Abstract***

The University of Fort Hare (UFH) is examined using the model/framework proposed. A formalised case study was conducted and is discussed and described. From an organisational perspective, it is found to be in a state of change that can be termed ‘transformational’. In terms of IS/ICT provision, it is found to have areas of excellence, as well as (unsurprisingly) areas needing attention. The conclusion is that IS/ICT is not used holistically or strategically enough, and the information needs of the organisation could be better met at all levels.

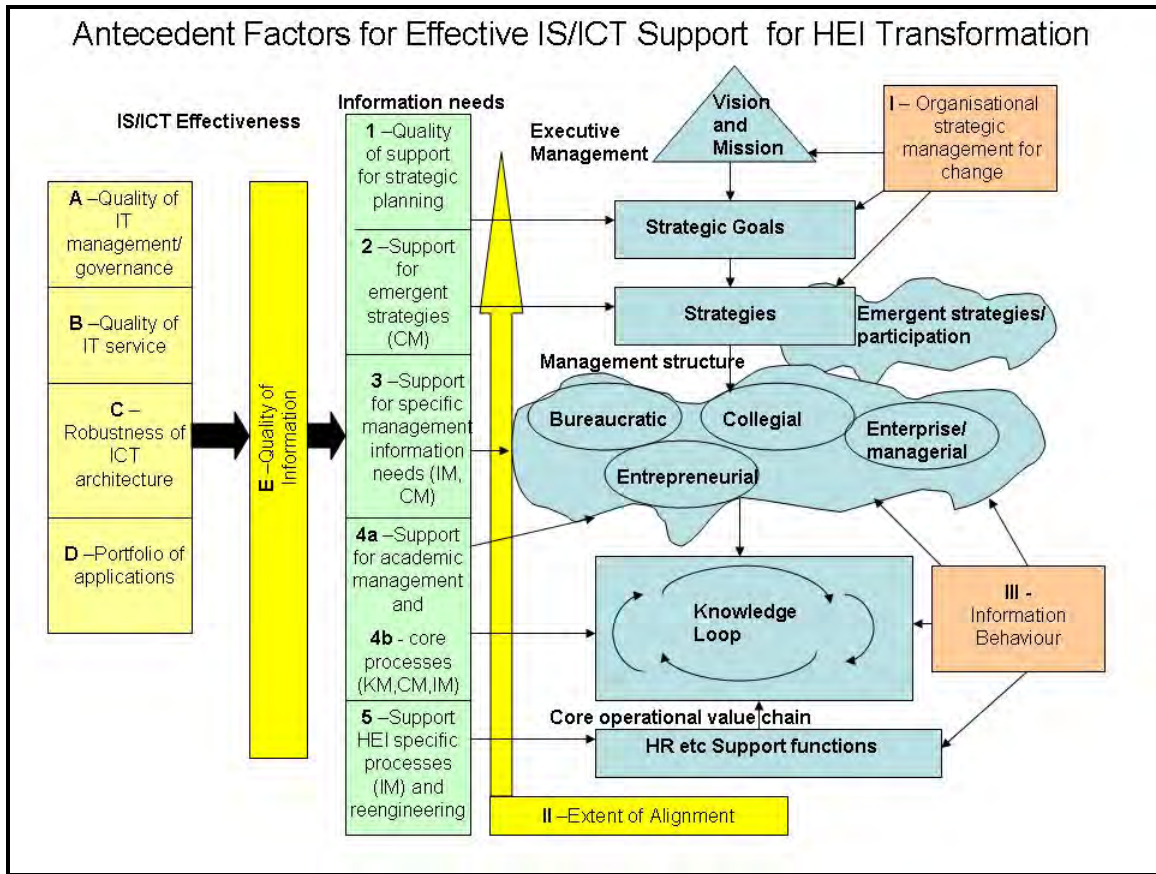
### ***D.2 Introduction***

This chapter uses a case study based method to examine and describe the role of IT in supporting the University of Fort Hare at both the strategic and tactical/operational levels with respect to change. It starts by describing the details of the research method. It continues by discussing the aspects of the University as defined by the proposed framework/model of antecedent factors, describing the context of the University and then specifically the perceptions of IT provision in the light of change requirements. It concludes by summarising the observations.

### ***D.3 Research process***

#### ***D.3.1 Case study***

As for the previous case, the study follows a case study approach using the framework (Figure D-1) through semi-structured interviews, following the protocol (see Appendix E), and limited questionnaire applications as dictated by the proposed model.



**Figure D-1 Analysis Model/Framework**

The questionnaires and interviews were conducted at the main campus (Alice) unless otherwise stated. The questionnaires regarding information behaviour were altered slightly as they had been found cumbersome in the previous case study, as will be shown in this report. One set of questions on information seeking and usage was left unasked from the previous case study as it was felt that it had not added a great deal to general understanding (Figure C-7), and in addition an extra questionnaire was introduced, to give a broader perspective on technology support for the HEI (Q2.5 Section D.12.1).

### **D.3.2 Interviews**

As stated in Chapter seven, the research is based largely on semi-structured interviews.

#### ***D.3.2.1 Time and place***

The interviews were conducted *in situ* at the University, mostly at the main campus of Alice, in October of 2004. A follow-up questionnaire was administered to the incorporated campus in August 2005. Further questionnaires and responses were elicited during the course of 2005.

#### ***D.3.2.2 Respondents***

The Registrar issued a letter allowing the research to take place. The Vice-Chancellor's Special Assistant, the Registrar and Deputy Registrar, a Dean and Head of Department, a senior academic, and the IT Director were interviewed. The Vice-Chancellor felt that the Special Assistant to the Vice Chancellor (SAVC) was better placed to respond to the questions. A senior tutor administered the Servqual questionnaire to a group of six students. For the later Servqual questionnaire administered on the incorporated campus, a student, a librarian, the IT senior person in charge, and an academic responded. The Chief Finance Officer (CFO) completed the Alignment Maturity questionnaire. Another attempt to spread this more widely was made by the CFO, who felt that it would be useful for a forthcoming executive management meeting on information strategy. However, this was not successful. The number of respondents for the questionnaires was smaller than that in the case study for RU. Suggested reasons for this were an arguably more limited experience of use of the ERP, and limited access to centrally provided information, as well as limited access to technology.

#### ***D.3.2.3 Protocol***

The protocol used was as reflected in Appendix B. At times, the conversations veered away from the designated questions, but this is normal with a semi-structured interview. The interviews were recorded and transcribed.

#### ***D.3.2.4 Ethics***

The transcribed interviews were emailed to respondents for corroboration.

### **D.3.3 Questionnaires**

Questionnaires were sent to the respondents mentioned above dependent on their positions. The respondents waited for the interview time slot to complete the questionnaires and used the time to discuss the contents rather than to complete the questionnaire.

## ***D.4 University of Fort Hare: Organisational context***

### **D.4.1 Overall context**

The University of Fort Hare (UFH) was established in 1916, and was initially called the South African Native College, and stemmed from the initiative of “black elite and early twentieth-century white liberals, many of them clergy, and supported by many traditional Southern African leaders” (Morrow). It is situated in the rural and down-at-heel town of Alice in the Eastern Cape. The University is the main industry in that town. Its history can be found on the web site. In its size and location, it mimics the position of Rhodes University. It has produced black leaders in various positions throughout Africa. It has been affected most directly by the political changes that have racked South Africa.

In the 1960s, it was demoted to a Xhosa ethnic University or “Bush College” as these institutions were referred to. Protesting staff and students were expelled (one of whom was ex-president Nelson Mandela). This downscaling of the institution had the effect of losing good students from the rest of Africa.

Between 1994 and 1998 it went from having a positive cash flow to being R120m in debt (Shaw, 2000, Swartz, 2005). The reasons for this were many: it had an excess of staff, student debt/overdraft was huge, and with the demise of the Ciskei Bantustan, that source of subsidy was removed (Shaw, 2000). In order to turn this around, an Acting Vice-Chancellor was appointed. An Acting Registrar and a financial consultant were brought in to turn the University around.

The University has a strong commitment to community involvement and research that is pertinent to the area. Its name ensures that it has a very favourable position when competing for consultancy, especially at provincial government level.

It is very reputedly the best known (South African) University throughout Africa. It has rebuilt relations and has strong contacts with students throughout Africa.

#### **D.4.2 Mergers: Incorporation**

The incorporation of the East London city campus was finalised in 2004. The city campus was originally a campus of Rhodes University. When the restructuring of Universities was raised, the first proposal was that RU and UFH merge. This was opposed by both the respective institutions. The city campus switch to UFH was a compromise position perhaps. The take-over of the city campus was defined as an incorporation and it was viewed as one of the simpler of the mergers that were taking place all over South Africa. It was in a sense unique in that a HBU was taking over a campus of a HWU while other incorporations were largely by HWUs. There have been difficulties, especially in process and culture. As always, mergers cause discomfort and stress.

The incorporation was initially viewed with enthusiasm by a large number of the staff members of the East London campus who saw the move as a move towards real (South) Africanisation. (Inevitably of course some staff members left to join Rhodes University and other Universities although they were not actively recruited.) Fort Hare University welcomed the incorporation as an opportunity to grow into the city thus expanding its traditional student base and gaining extra academic skills.

Students on the East London campus were on the whole (regardless of race) less pleased. The students who had registered under Rhodes University were promised that they would graduate with a Rhodes University degree (so-called “pipeline” students), while the students who registered in the transition period were promised a joint degree. This served somewhat to stem the tide of students wanting to change their registration by leaving. The newly acquired campus had a different profile of students who were more assertive, were used to a reasonable customer focus, and came from a city environment. No residences were provided (although this has changed slightly in the last year for select students) and thus students who

did not live in the city had oppidan accommodation. After the incorporation, a small student survey (conducted in 2004 in the Department of Information Systems as part of a research module) showed that students were dismayed at what they perceived to be a diminished customer focus (especially ex-Rhodes students).

The incorporation process was well planned for and workshops were held to structure faculties. A joint transitional task team (JT TT) was formed who did extremely useful and hard work.

### **D.4.3 Structure**

The University has the usual structure. It has a Council which has final decision-making ability composed of luminaries from outside the University, with some representation of University staff, and with the management staff in attendance. Membership of Council has changed to involve a wider cross section of society. A non-executive Chancellor heads the institution, with an executive Vice-Chancellor. At present, the post of Vice-Principal is being advertised. There is an Executive Management Committee with very wide representation from within the University. Some staff members maintain that it is too large to be called an Executive Management Committee, and that it serves more as an implementation committee.

Faculties have been restructured into 5 Faculties (Education, Law, Science and Agriculture, Management and Commerce, and Humanities and Social Science). This restructuring follows on a restructuring in 1999-2000 where Faculties were merged and reshuffled. The academic structure has changed from the traditional departmental discipline-specific structures to embrace the new concepts of multidisciplinary programmes and schools. The Faculties are headed by Executive Deans (of which 2 are permanent positions and the others acting) and the Faculties are composed of Schools and Centres headed by Directors, offering programmes. Departments still exist, headed by Heads of Departments (Units), and some confusion exists between the old structures and the new. One respondent stated that lip service was being paid to the new programme-based focus.

Senate and Faculty Boards are in place. Senate membership is limited to senior academics, but students are represented, as well as non-academic members. A large number of Senate

committees exist, and all decisions are made through these committees. The discretionary powers of Deans and Heads of Departments are restricted in comparison with Rhodes University. Despite the change in academic structures, the administrative structures are largely traditional. Faculty officers are in place, and different student and staff support departments that deal with facets of student and staff administration exist. Deans as Executive Deans have a responsibility for fund raising, earn large salaries and have budgets to manage.

The University has a small Bhisno campus that services the needs of Government in terms of consultancy and training and offers limited, mainly public sector, courses for degrees in public sector management and administration. Its Fort Hare Institute of Government (FHIG) and the Public Finance Sector Agency (PFSA) offer short courses and training as well as consultancy to Government and are administered mainly outside the normal University structures, although they report to the Dean of the Faculty of Commerce, Management and Development (as it was called previously).

The University has also recently acquired a city campus in East London, incorporated as a result of the HEI merger process (Section D.4.2).

The University hosts the liberation (or “struggle”) archives, as well as having a unique collection of (South) African Art.

#### **D.4.4 Statistics**

It is a small university. Growth is constrained by the need for residential accommodation and by the Government’s capping regulation. The campus at Alice has approximately 7000 students (2002), while the newly acquired city campus had approximately 2000 students at the time of incorporation.

The staff to student ratio at the East London campus is as follows (University of Fort Hare, 2002):

<b>Faculties</b>	<b>2000</b>
Commerce	1:19
Education	1:25
Humanities	1:8
East London Average	1:15

**Table D-1 Staff student ratios EL**

At the Fort Hare Alice “Main” Campus (UFH Due Diligence report, 2002) the ratios for the Faculties as they were constituted then were:

<b>Faculties<sup>8</sup></b>	<b>2002</b>
African & Democracy Studies	1: 31
Agriculture & Environmental Studies	1: 12
Management, Development & Commerce	1: 64
Science & Technology	1: 16

**Table D-2 Ratios on the Alice Campus (average not published)**

The ratios in bold-type are areas of concern and points to difficulties in attracting academics to a rural village, and also point to the diminishing attraction of a Humanities degree at the time of publishing at the city campus.

The student breakdown per faculty over the past five years indicates substantial growth. The growth from 2001 to 2002 was of the order of 40%. A large portion of this growth can be attributed to an increase in the number of part-time students in the Faculty/School of Education engaged in in-service training programmes (UFH Due Diligence report, 2002).

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<sup>8</sup> Faculty Names differ as they have since been restructured



The salaries budget was 69% of total budget for 2005, but will be 64% in 2006 (SAd, 2005). Not clear is the ratio of teaching or administration, management and other support staff. Compared with the UK average of 59% for the salary bill as a percentage of the overall budget, and 33% academic staff costs versus 26% (Court, 2005), it would be interesting to know these figures for all the case studies, but these were not ascertained. (A benchmark figure of 60% of the budget going to salaries and wages in SA HEIs was mentioned in the Daily Dispatch report, June 14<sup>th</sup> 2006 (WSU Strike Ends, 2006).).

#### **D.4.5 Strategic management**

##### ***D.4.5.1 Strategic management, vision and mission***

The University has followed methods of rational management by having most facets of strategic management in place. The University has had formal planning in place especially with what is known as the Strategic Plan 2000 or SP2000 (University of Fort Hare, 1999), which was the driver for rescuing the University in 1999-2000. As the VC noted, the urgency and extent of planning in 2000 was much greater than in other HW institutions.

“The magnitude of transformations required to mould Fort Hare into a sustainable higher education institution should not be under-estimated and cannot be equated with the normal institutional planning or strategic planning exercises undertaken by more historically advantaged institutions. The changes required are irreducible to simple “adjustments” in policy and strategy, but .... imply a fundamental reconstruction and development of an institution that has been under-developed through systematic government intervention for decades. In other words, UFH SP2000 denotes a process of comprehensive structural planning” (Swartz, 2005).

Planning is meant to be done on a three-year rolling cycle. However, the incorporation has altered that, as planning had to start afresh. An Interim Operating Plan (IOP) (University of Fort Hare, 2003a) was devised which still serves as the temporary strategic planning document.

##### ***D.4.5.2 Vision***

The VC is committed to ensuring that the University is not a traditional “ivory tower”. He points to the location and the surrounding poverty on the main campus, and promotes an “engaged” university.

Extracts from the published mission and vision statement are reproduced from the website and shown here. The University is committed to becoming a:

“sustainable African university committed to teaching and research excellence” that “builds upon its unique historical leadership role and rural location” and “to become meaningful and critical participants in the social, economic and political development of society” (UFH website<sup>9</sup>).

This vision, as can be seen, is rooted firmly in the historical context of the University.

#### ***D.4.5.3 Mission***

The mission again emphasises the need to generate knowledge that is “socially and ethically relevant, and applying that knowledge ...to the development of our nation and the wider world” (UFH website).

#### ***D.4.5.4 Strategic thrust with respect to change***

Staff interviewed mentioned strategies to address the “drivers of change”, collated here.

Respondents: Senior Advisor to the VC, Senior Academic, 2 Senior Administrators, 1 IT Management

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<sup>9</sup> The website has undergone a major change and there are differences in the what is quoted and what now appears on the website (late 2006)

<b>Q1.1 Strategic objectives and drivers of change</b>	
<b>Drivers of Change</b>	<b>Strategies to achieve goals</b>
Mergers	JTTT Merger office
Massification/ capping	Enrolment planning
EE	Plan to meet government targets
Demography	Ditto
Research	Research development plans and inducement for research
Resource squeeze/ Search for external funding	Fundraising no specific target; 3rd stream income, projects
Technology Push	Access to ITS <sup>®</sup> information for all; Bandwidth, email robustness, equitable computer lab ratios
Mixed mode teaching delivery	Distance education programme & several others in education; Identifying niche areas and appropriately located programmes
Strategic leadership	Interim Operational Plan
Open Access	SDE, Faculty specific foundation programmes
Globalisation	Recruiting foreign students
Third stream income	Fundraising - no specific target; 3rd stream income, projects
Broad access to information	Rollout of v12 of ITS <sup>®</sup>
Community Projects/ Relationship building	None specifically mentioned

**Table D-3 Strategies**

#### ***D.4.5.5 Strategic objectives/change drivers***

In SP2000, the strategic objectives were the following: “enhancing institutional revenue, improving teaching and research excellence, modernising support services, creating a better quality of life for students and staff, and re-linking the university to its wider habitat”

(Swartz, 2005: 21). This last issue was epitomised by the need to forge links with government at all levels, to engage in development without losing the University's independent critical stance, and to forge links with business.

On interviewing members of staff, the following were highlighted (shown in order of importance) as issues that need strategic management. (Note that this table may not correspond to the other case studies, as respondents were asked to add other change drivers according to their views for the HEI).

Respondents: 1 Executive management, 1 Senior Academic, 1 Senior Administrator, 1 IT Management

Rating Scale: 1 to 5 where 1 = low and 5 = most important.

<b>Q1.1 Importance of change drivers</b>	
<b>Drivers of Change</b>	<b>Importance</b>
Mergers	4.3
Massification/ capping	4.0
Employment Equity of Staff	3.5
Demography of students	3.5
Research	3.3
Resource squeeze/ Search for external funding	2.0
Mixed mode teaching delivery	1.7
Strategic leadership	1.5
Open Access	1.5
Globalisation	1.5
Third stream income	0.5
Broad access to information	0.5
Involvement in "development"/community projects/ relationship building	(not ranked)

**Table D-4 Strategic Objectives**

The University has taken the requirements of Government very seriously regarding opening access and involvement in research, and consultation that involves the Eastern Cape is given priority. One of the main change drivers has been to become economically self-sustaining, and third stream income is being pursued vigorously.

**D.4.5.6 Emergent change**

The politics of Zimbabwe and the position of the Walter Sisulu University merger (of two technikons operating in the Eastern part of the Eastern Cape – Border Technikon and East Cape Technikon- and the University of Transkei) are issues that may affect the University in terms of student recruitment. The former is of importance since such a large contingent of Zimbabwean students (nearly 25%) is annually part of the student in-take. The future of the University of Transkei (Unitra) may also affect student recruitment.

Some change is occurring due to the influence of the newly incorporated city campus, variously through the addition of extra resources such as the library, the involvement with the private sector of the lecturers on the city campus thus bringing business experience into the teaching, as well as the staff generally casting a critical eye on processes, both administrative as well as academic and focusing attention on processes where maladministration is occurring. The students are also more vociferous than their Alice counterparts.

**D.4.5.7 Success of strategies**

The opinions on the success of the strategies was elicited, and reflected in Table D-5.

Respondents: 1 Executive Management, 2 Senior Academics, 3 Senior Administrators, 1 IT Management

<b>Q1.1 Success of strategies</b>		
<b>Drivers of Change</b>	<b>Strategies to achieve goals</b>	<b>Success</b>
Mergers	Merger office	Minimally successful
Massification/ capping	Enrolment planning	Still to be implemented in line with
Employment Equity	Plan to meet government targets	EE plan implemented
Student Demography	Ditto	Successful

<b>Drivers of Change ctd</b>	<b>Strategies to achieve goals ctd</b>	<b>Success ctd</b>
Research	Research development plans and inducement for research	Major improvement
Resource squeeze/ Search for external funding	Fundraising -no specific target; 3rd stream income, projects	This has been successful as a first start of securing external funding, but more needs to be done in actual fundraising to build up capital as it has not been a revenue generator for the organisation.*
Mixed mode teaching delivery	Distance education programme & several others in education; Identifying niche areas and appropriately located programmes	Not immediately successful – resource squeeze
Strategic leadership	Interim Operational Plan	Core management team in place - quite
Open Access	SDE, Faculty specific foundation programmes	Access is already open (too open?)
Globalisation	Recruiting foreign students	No major change, but successful with the intake of Zimbabwean students
Broad access to	Rollout of v12 of ITS <sup>®</sup>	Successful in allowing more users
Community Projects		Support for workers' (gardening, cleaning) co-ops; agricultural co-ops
Other factor(s) that you view as most vital for the success of your institution		
Compliance with National HEI requirements, that is funding formula; benchmarks for research and teaching outputs; and the correct programme qualification mix		Data is not accurate
Investing in the infrastructure and calibre of academics to drive teaching programmes		
*The University has set up a Foundation (Fort Hare Foundation) that handles unencumbered income and is active in fundraising activities.		

**Table D-5 Success estimates**

As noted in Table D-5, several of the strategies are bearing fruit.

- The practice is to have very open access for a percentage of students and a Senate Discretionary Policy (SDE) to allow students entrance via non-conventional routes. This

is becoming accepted practice in most Universities and especially so in view of the fact that the matriculation results are no longer reliable indicators of University success (or at least untested as yet). This University was at the forefront of allowing students with no exemption, access. Some doubt about the success or wisdom of this policy is expressed, as the resources to support under-prepared students do not exist. To counter this view, it has been pointed out that some of these students who may have conditional exemptions fare as well as the “normal” entrance students.

- Employment equity is pursued at all times. It is difficult in the academic sector to attract good black South African academics as has been discussed before, and perhaps paradoxically, more so for Fort Hare where the salaries do not match public and private sector salaries, and Government, in particular, attracts many of the top South African academics from Fort Hare.
- Student demography is not a problem – the main campus is mainly black South African. What could be a problem is that there may not be a representative sample of other race groups.
- Campus safety requires attention, although this has not been mentioned as strategic.
- Research has received a major boost by the appointment of an Acting Dean of Research. He has made great strides in encouraging research with the support from the VC, and Fort Hare has, perhaps unrelated to these efforts, two “L-rated” scientists. Although perhaps not clearly articulated as goals, the focus on research and community involvement is very apparent when talking to senior staff members. The seriousness with which management views these objectives is of course often judged by where and how the budget is apportioned. Research is attracting a much better slice of the budget than before largely thanks to the newly acting Dean of Research’s efforts. The Deans have also been active in raising funds for community involvement projects.

The university has policies and objectives that echo its vision and mission. The University has modelled itself on the “modern” entrepreneurial university as delineated by Clarke (SAd, 2004). It has done so by being far more involved with the external community, particularly provincial government. It has formed several institutes whose main function is to provide

training and consulting services to government. It has also developed a process of “3<sup>rd</sup> stream income” which has been successful and is being revamped. A senior staff member stated that the University should not be a traditional University – it had to have social relevance (SAd, 2004). However, although it is moving forward on these objectives, its main focus has been on “turning the University around”, especially in trying to rid it of its debt. Control of the finances has been very successful: as the outgoing VP Finance stated: when he started at the University there was a R70 million debt and as at the end of 2004, this had changed to no overdraft (SAd, 2004).

On the negative side, a senior administrator stated that academia was being “put on the back burner and yet it is the core of the University” (SAd, 2004). What is urgently required and has been recognised as vital is what a team of senior academics call “revitalising the academic heartland”, and they have proposed various strategies for this. One of these is to increase the academic strength by bringing the academic versus administrative budget to a more industry-standard ratio.

Massification was not an issue as the University was being allowed limited growth by government and the residences have limited capacity on the main campus.

#### ***D.4.5.8 Merger/incorporation aspects***

The process of incorporation was overseen by a State funded merger office. Many workshops were held especially during the transition period of incorporation, but there were almost too many workshops, and academic staff were often loath to attend as they had teaching duties. This was particularly true for the city campus where teaching occurred during the day and evening to cater for part-time students. What resulted was a “baton-passing” decision-making process: Decisions made at one workshop were superseded by decisions made at the next workshop often by a different group and decisions were often also made by contract staff from institutes or junior staff members with little University experience. The merger office facilitated workshops, but much of the work done by the JTTT was not carried forward as the members of the task teams were no longer involved in decision-making regarding the incorporation. Success of the incorporation may be judged on the city campus by student growth within State restrictions, staff stability, and maintenance



of the levels of service and support received for the core processes. There was a loss of highly qualified staff and “good” students initially. The student body has grown in 2006, however. The quality of the support services diminished, but reengineering projects are underway to improve them.

The University is busy “reinventing itself”, and this is not a painless process. It has been very successful in some aspects of change, the jury is out on the incorporation process, and strategies to strengthen the core of teaching as well as administrative functions are in the process of brought into being.

#### ***D.4.5.9 Culture***

When asked about the culture at Fort Hare, one respondent stated that it had layers of culture as the University has moved through different eras, and staff members from these eras form the university body. The University has an amazingly diverse staff body with academics from all over Africa and indeed elsewhere. The same respondent noted that there was not a unified culture or sharing of values yet. The culture could well have been that of a “family”, given the size and situation of the main campus, but this was not the case. The incorporation of the city campus has now added another layer of complexity to achieving a unified culture. A common set of values are being created as a start to building a unifying culture.

Many staff live 180km away from the Alice campus and a steady stream of staff is seen leaving campus once lectures end. The lack of a strong staff presence on the campus is felt. Some staff consult in the nearby centres of King Williamstown and East London on a regular basis. It is difficult to recruit staff to the Alice campus, and it has been jokingly stated that many are eco-lecturers who are there because they love the rural ambiance. A large proportion of the lecturers is from the rest of Africa, which adds a cosmopolitan nature to the campus. The University is fortunate in being able to secure good academics from the rest of Africa, although there are difficulties with Home Affairs regulations and a “Them and Us” perception exists between local and foreign staff.

Academic staff are often demoralised by the difficulties they face in having had poor resources inherited from the past - chalkboards are still the norm in many venues. This is changing, as the teaching infrastructure is being upgraded as funds become available.

Academic staff are hard worked and as badly paid as academics elsewhere, if not more so, and staff/student ratios are in areas unacceptably high as mentioned earlier.

Some staff members are intensely proud of belonging to Fort Hare, especially staff who were involved in the “turn-around strategies”. They work tremendously hard and are extremely loyal to the Vice-Chancellor and the University.

#### ***D.4.5.10 Merger/incorporation aspects***

The cultural difficulties occasioned by the incorporation were inevitable. The city campus was a professional campus focused on the needs of the city, while the main campus is more traditional, serving a largely rural student body with a body of academic staff that were very cosmopolitan. One of the larger faculties and the original *raison d’etre* of the city campus was the Commerce Faculty. It had an independently minded entrepreneurial set of values resulting in entrepreneurial projects and courses for the community, with a focus on efficiency and effectiveness, while its research culture was not strong. The culture of the main campus was different given the history and the effects of apartheid on the University as described already. The centralisation culture sat uneasily on a city campus that was more entrepreneurial with responsibility and decision-making devolved down to departmental levels. Problems that have arisen have often been attributed to the racial and entrenched biases, but are in the author’s view more often the result of the value differences.

#### **D.4.6 Students**

The students on the main Alice campus are often from rural backgrounds and real poverty is found amongst these students. A large proportion of students come from Zimbabwe. These students have had excellent school education and often achieve better results than the local students. Some xenophobic tension results from the differences.

Students on the main campus are remarkably unassertive given their history. Respondents stated that students were very vocal 4-5 years ago, but they now appear apathetic and tolerant of shoddy treatment (SAc, SAd, 2004). Long queues at registration are not seen as unreasonable and lax teaching practices are not questioned. Students largely come from disadvantaged backgrounds and under-prepared students have been admitted in line with the

requirements of Government for increased and broadened participation taking into account potential (“Successful policy must overcome an historically determined pattern of fragmentation, inequality and inefficiency. It must increase access for black, women, disabled and mature students, and generate new curricula and flexible models of learning and teaching, including modes of delivery, to accommodate a larger and more diverse student population” and “they should ensure that selection criteria are sensitive to the educational backgrounds of potential learners, and incorporate the recognition of prior learning which is an essential concept in the elaboration of the NQF” (Department of Education, 1997b).

The incorporation of the city campus has brought yet another different group of students who are far more assertive, and continually analyse customer-centric and bureaucratic-centric practices. Their frustration leads to open letters to the local newspaper, and this is unfortunate for the University. This level of frustration should diminish as the systems are improved<sup>10</sup>.

#### **D.4.7 Management and decision-making style**

##### ***D.4.7.1 Management style and structure***

The structure of the University moves between being bureaucratic, and authoritarian or managerial, while also striving to encourage entrepreneurship. It is a strongly centralised and bureaucratic operation. The Vice-Chancellor still makes most important decisions. As stated by Shaw (2000), the “dysfunctional” committee decision-making was suspended, and replaced with a centralised “benevolent” autocracy. This was done to speed up decision-making, and although decision-making has reverted to committees, some remnants of authoritarianism or “managerialism” linger. Although the move is to go back to the committee structures and give power to the executive deans and faculties, there is a mix of the two modes. The bypassing of committee structures, or the fact that all important decisions had to be made centrally, had the effect of a lack of transparency and trust in the committee structure, disempowerment and can lead to a lack of accountability.

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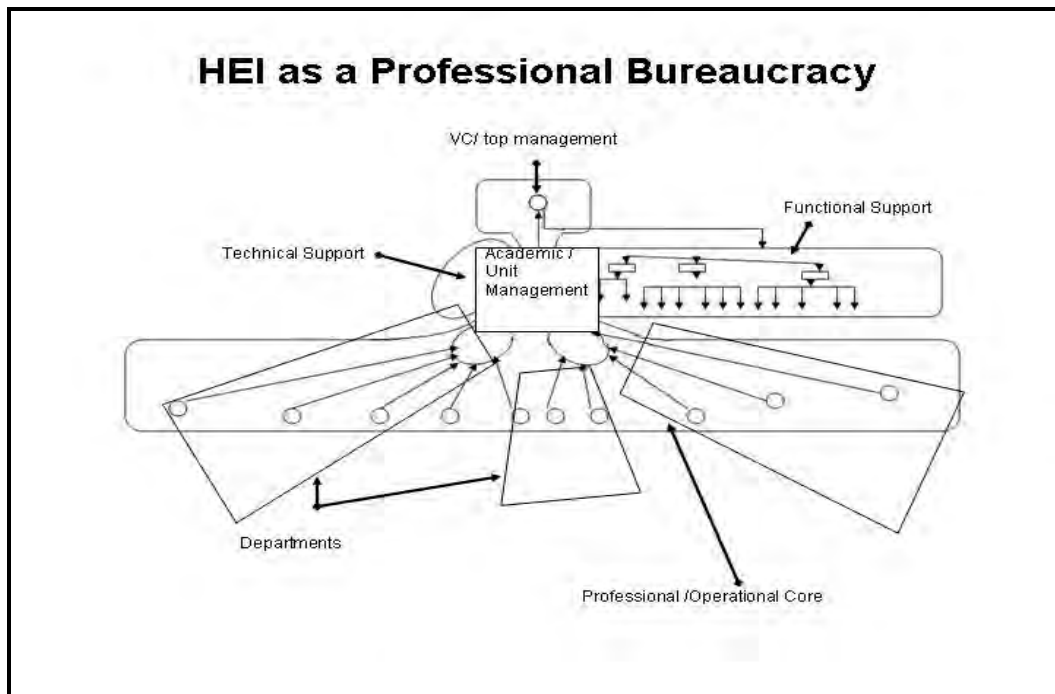
<sup>10</sup> The registration process for 2006 was a major improvement where the Registrar’s division was congratulated on their success, and this points to reengineering success

As stated, there is a move to give more power to Faculty offices, and this is a positive move, but some administrators view this as a ploy to shift problems and volume of work that should be dealt with centrally. Hopefully the areas that are in contention will be ironed out with the new examination of processes.

As regards performance management, no system is in place, but a Balanced Score Card initiative is underway that will provide this.

#### ***D.4.7.2 Management structure***

Using Minzberg's depiction of a professional bureaucracy (Figure D-2), UFH differs from the previous HEI (RU) in having formal academic management in place with the appointment of executive deans and heads of schools. An attempt was made to blur the departmental lines to allow for interdisciplinary sharing. The organisation has, however, reverted to departmental structures, with some innovative interdisciplinary programmes in the pipeline at the postgraduate level. The perception is that the administrative and techno-support structures are top-heavy, as compared to the academic layer.



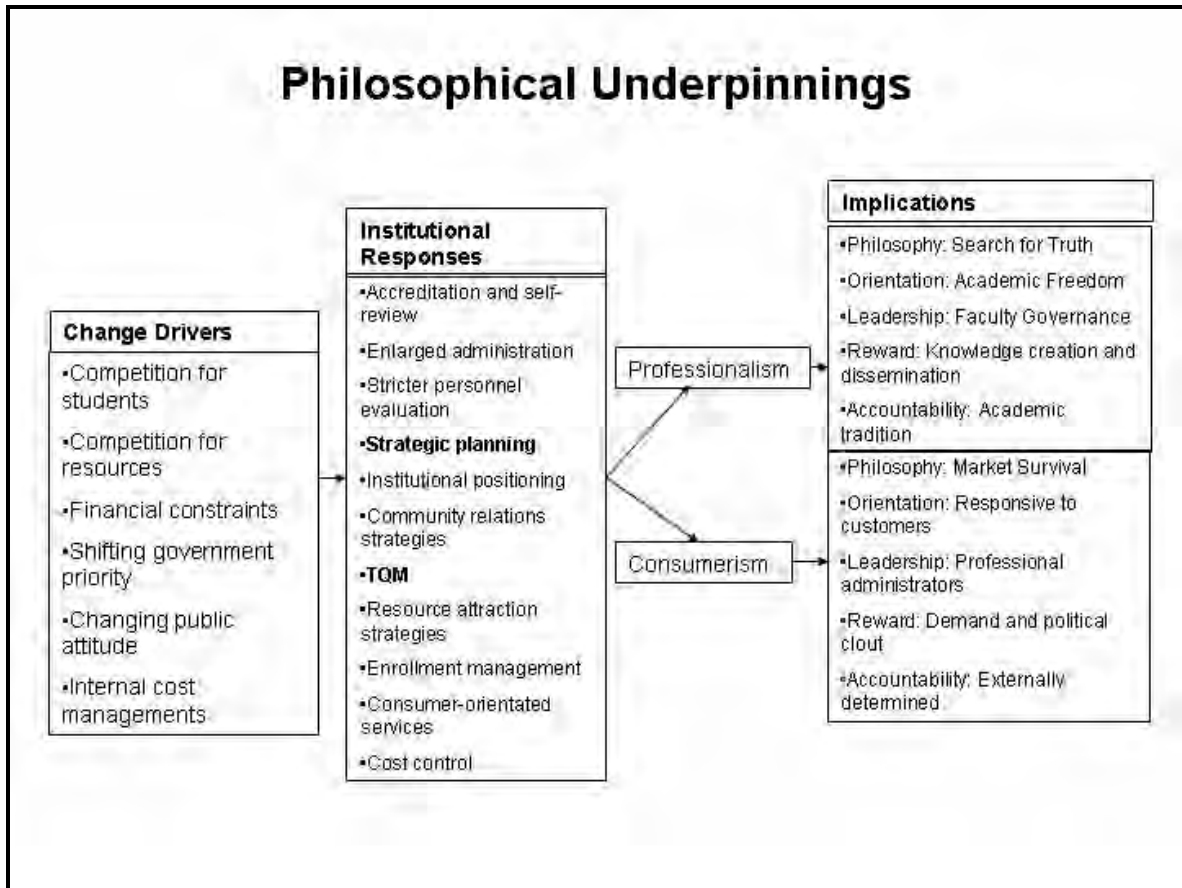
**Figure D-2 Professional Bureaucracy adapted**

### ***D.4.7.3 Decision-making balance***

Decision-making is inherently slow because of the committee structures, but also at times caused by having to await Senior Executive approval. The latter has caused major hold-ups as the senior executives are on heavy schedules. However, there are also other factors that inhibit speed of decision-making and effective implementation. Committees suffer from lack of consistent attendance, changing dates, and delays in starting times. The lack of timeous minutes (>24 hours before meeting) at times hampers work being done between meetings (Ad, SAd, 2005). Some of the committees meet very sporadically and attendance at the “less important” ones is poor. The executive management committee has very large (27) membership, and while this is extremely useful as a forum for getting buy-in and hearing all the views of the very different members, it makes it difficult to function as a strategic decision-making body. The VC’s presence to monitor implementation is very important (SAd, 2005). Another reason for slow decision-making is that responsibility for decisions get passed from one support unit or person to another, and tracing the status of a request is time-consuming.

Decision-making is largely very centralised, although there is a move to give Faculty Offices more power. Some process reengineering is also underway for administrative functions, and these moves should alleviate the efficiency of decision-making.

Using Michael’s analysis (Figure D-3), UFH can be seen to have chosen a “Consumerism” approach. That said, the focus on the customer and customer-service is still being grappled with (as has been quoted as being the case for many HEIs).



**Figure D-3 Philosophical Underpinnings – Michael (1997)**

### **D.4.8 Effective processes**

The perception of effectiveness of the administrative processes is low. This view is particularly expressed by students on the newly incorporated city campus. Some of the difficulties can be laid at the door of different processes (which are not liked just because they are different), some because the complexity of the merger was not fully appreciated, and some because of malfunctioning processes (Ac, 2005). One senior academic noted that there were “too many administrators – more than necessary” (SAc, 2004).

To address this, the Registrar’s division has launched into a major reengineering phase to meet the needs of the new reality, and administrative staff have had externally funded training in aspects of their work (SAd, 2005). This colours many of the remarks later, where

progress is being made, but at the time of writing was not yet in evidence to the University community. The next division to be “reengineered” is the HR Division.

The Deans are Executive Deans with a Faculty budget. The budget is tightly defined, and not a great deal of discretionary spending is available. Interestingly, the Deans appear to make few decisions regarding student matters without the agreement of the Faculty boards, such as whether a student may deviate from a curriculum, compared to RU. Such decisions are debated at length through the faculty’s “Planning and Management” Committee, Faculty and then Senate.

The Fort Hare Foundation, Fort Hare Institute of Government (FHIG) and the Public Finance Service Agency (PFSA) have been running systems outside the normal University systems. As such they had their own HR, IT and Financial support systems. The reason for this has been to circumvent the notorious delays in the administrative processes, and to be able to make fast and flexible decisions as opportunities arise. This arrangement has, however, brought its own set of problems of lack of control and accountability and the new CIO has brought those functions “back into the fold” (SAd, 2005).

## ***D.5 IS/ICT Strategic Management***

### **D.5.1 IS/ICT importance**

IT is viewed as critically important by the University Planner (who stated that accuracy was vital for subsidy claims), and the IT Director. By contrast, a senior administrator’s view was that it was strategically not “as important as it should be” (SAd, 2004). The VC has realised the importance of internal electronic communications (SAd, 2004). One senior administrator stated that IT was vital, and second only to administration. Also that everyone should have the necessary IT literacy skills (SAd, 2004). He further stated that the organisation was committed to good IT provision and this was demonstrated by the appointment of an IT Director and new laboratories being installed (SAd, 2004).

The IT Director sits on the Executive Management team that meets once a month. The IT Director reports to the newly instated Chief Operations Officer (COO).

Merger funding has been made available specifically for IT costs for institutions affected by State-regulated change, and thus UFH. However, the IT normal budget is approximately 0.5% of the organisational budget when merger funding is ignored. This seems low.

If McFarlane's and McKenney's grid is used (Figure D-4), the left bottom quadrant fits the views of IT expressed by most administrators and management, which is that IT is valuable, but not critical, to success. The reengineering of the Registrar's division may move IT position to the right on the grid: straddling Support and Factory. The fact that the IT Division's information is not published on the web is perhaps an indication of the level of importance of its role.

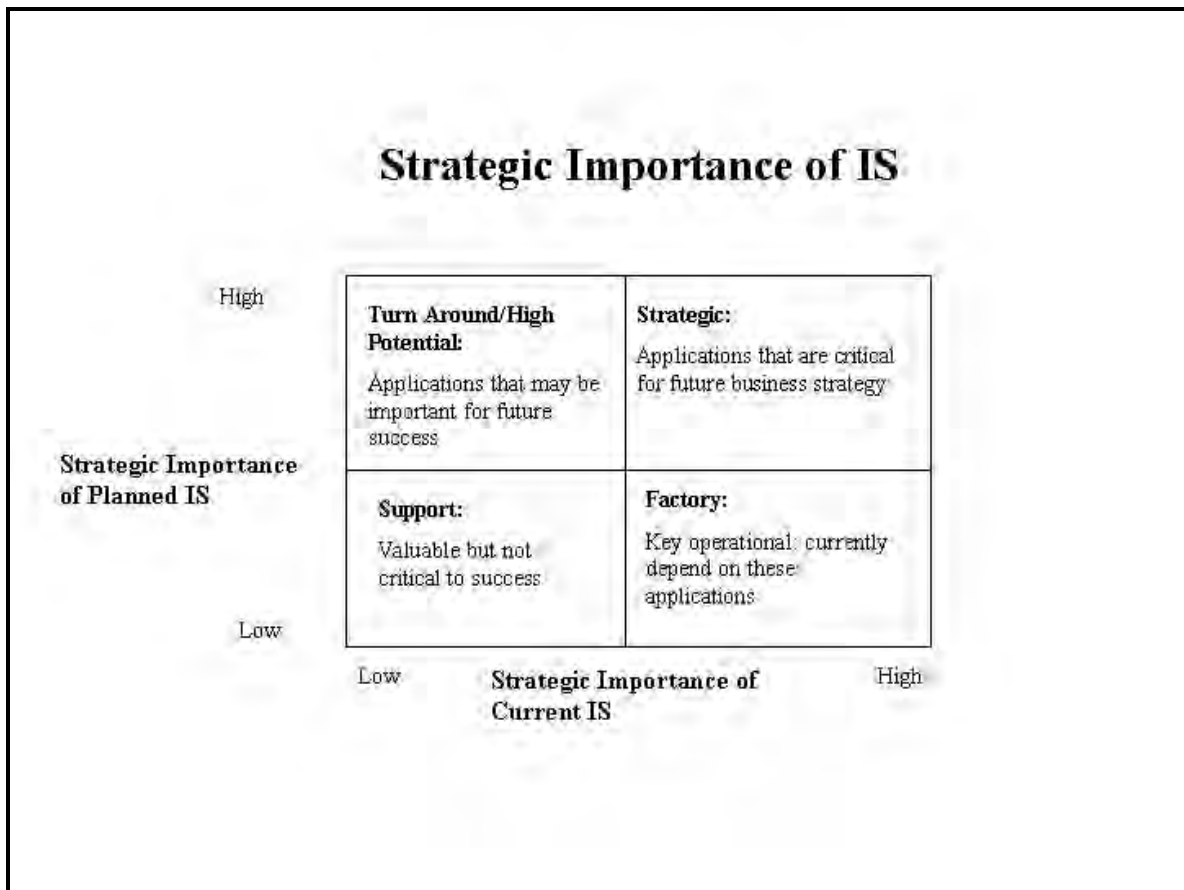


Figure D-4 Strategic Importance - McFarlan and McKenney (in Ward and Peppard, 2002)



### D.5.2 Background

The University has come from a state of being extremely under-resourced in terms of technology. Workstations both for staff and students were in short supply, teaching equipment was poor, and the access to computers and the Web has been low to non-existent for staff and students.

The IT Director who was serving in an acting capacity was confirmed in the position in 2004. The challenges faced were the installation of a new network to include the new city campus as well as the Bhisho campus. To complicate matters further, units exist in the city that are at a distance from the campus, such as the Fort Hare Foundation, the Nursing Sciences Unit/Department, and some others. Although some operated independently, as mentioned earlier, the move is to put them all on the same network and systems.

### D.5.3 IT provision ratios

The library's electronic services are good. The SEALS project which is an Eastern Cape consortium initiative between the tertiary institutions in the Eastern Cape is instrumental in this.

The number of workstations is given in Table D-6 (interpreted from figures circulated by the IT Director in 2005):

<b>Workstation provision</b>			
<b>Location</b>	<b>Specialist/restricted<sup>11</sup></b>	<b>Open</b>	<b>Library</b>
Alice	185	101	70
Bhisho			43
East London	54	120	10

**Table D-6 IT provision (estimated)**

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<sup>11</sup> Special and restricted computer laboratories' use is limited to certain groups of students: Computer Science and Accounting students are examples.

These figures are approximate as, for example, computers are waiting to be installed for the Education Faculty.

Funding has been forthcoming to equip computer laboratories for special programmes. For example, funding was made available to enable the Thuthuka programme which educates previously disadvantaged students to become chartered accountants.

As regards infrastructure, the merger funds have made it possible to set up a comprehensive modern infrastructure to link the three campuses, and several organisations including Telkom and Microsoft have provided computer laboratories. The network that has been installed has been done in conjunction with a leading IT company. The University is a “Microsoft shop” as well as being a user of Cisco equipment.

An academic (Ac, 2006) estimated that 90% of staff have workstations, but was unsure of how usable these were. Certainly some staff members received workstations only in the latter part of 2005.

#### **D.5.4 Strategic planning and management (SIPM)**

An ICT Strategic Plan has been formulated. Draft submissions were made at two workshops held in 2003. After this, a submission was made to the Executive Management Committee (EMC). The planning is semi-formal according to the IT Director. The IT Director states that strategic planning is done and revisited annually, and that project plans exist. A strategic analysis of the IS/ICT needs of the organisation has been done (IT Mgm, 2004), although an IT staff member disagrees (IT Ad, 2004). This could be the result of a lack of communication as the plans are not at present published.

An IT strategic plan was submitted to the executive management meeting in December 2003 (University of Fort Hare, 2003b), and covered the following areas:

- Infrastructure: network; server; cabling; firewall and antivirus security.
- Products and services for the campus community: Desktop hardware maintenance; accessibility of email and the Internet; guidelines on policies.

- Global software licence requirements: Campus-wide agreements; e-learning applications; open-source implementations.
- Strategic support: Accessibility to student data; online admission and registration; web based MIS; eLearning via WebCT<sup>®</sup> and video conferencing streaming. (University of Fort Hare, 2003b).

The document details how these services will be provided and amongst others this states:

A 5-year replacement policy for PCs should be implemented;

- Under Internet Services, the document notes the intention of establishing a portal service, and to manage bandwidth “more strategically” depending on the class of user;
- Under Desktop Support, mention is made of the intention to implement a “workflow solution” to “enable process flows across disparate systems such as meal card systems, access control systems, printing services and photo-card systems”

The latter point is somewhat puzzling as not many of these systems exist.

Furthermore it states that the IT Division (Technical Support Centre or TSC) “must develop and maintain crucial faculty based systems that support administrative processes”, and implement a “fully fledged ... archiving system that meets statutory requirements”.

Also mentioned is to make “it possible to bring together commercial software such as WebCT<sup>®</sup> and locally developed course management software: (University of Fort Hare, 2003b).

Based on a question of whether there are measures of implementation success, one affirmative reply was received from IT Management who stated that there were project management plans with specific deliverables. However, a senior administrator and an IT staff member stated that there were no measures in place (ITMgm, SAd, IT staff, 2004). The reason for this disagreement could be that the plans referred to were those for the new network installation which was being done by an outside company and which had specific project deadlines, but not to the other aspects of the strategic plan.

When the components of the ICT plan are examined using Roets's adaptation of Earl's planning model, (that is, technology planning, information systems planning, information planning, and knowledge and communication planning), it can be seen that technology planning makes up the bulk of the document. The mention of software is interesting, as well as the fact that a portal has been mentioned, but the focus of the document is more operational than strategic, and mainly hardware focused.

The next section examines the alignment of the provision of IS/ICT with the organisational strategies and requirements in a changing world.

### **D.5.5 Knowledge and Communications Management**

KM and CM do not form part of the strategic planning process. Emergent and implemented KM and CM will be discussed throughout the chapter, and with special reference to transformation.

### ***D.6 Extent of Alignment***

On the issue of whether the IT strategies supported the University strategies, the view of a senior Administrator was that the IT Director was involved in organisational strategic planning, but that top management was less involved in IT strategic planning (SAd, 2004). The IT Director by contrast felt that top management was fully involved in IT strategic planning as well as the IT Director being fully involved in organisational planning.

When the ICT Strategic Plan's support for "the University's strategic direction" is examined, it is not clear how this speaks to the University's strategic objectives, except perhaps for the merger requirements.

The alignment maturity index was calculated based on the maturity questionnaire (Q1.2 in Appendix E). The number of respondents to this questionnaire was very low, as most said they had very little idea of the operations of IT. A Senior Administrator and the IT Director completed the questionnaire. The CIO was very keen for the questionnaire to be more widely completed in preparation for an Executive Management meeting regarding information provision. The IT Director was tasked to promote this, but there have been no

results from this as at the time of writing. However, the two views are shown in the summarised Table D-7 and used as triangulation for perceptions and sentiments noted.

Respondents: Senior Administrator (User) and IT Director.

Rating Scale: 1-5 where 1 = “Lowest level of maturity” and 5 = “Highest level of maturity”.

<b>Q1.2 Alignment Maturity Index</b>		
<b>Alignment Categories</b>	<b>User</b>	<b>IT</b>
Communications	1.4	2.5
Competence/Value metrics	1.0	2.1
Governance	1.3	2.1
Partnership	2.0	2.0
Scope and Architecture	1.3	2.8
Skills	1.5	1.9
Average	1.4	2.2

**Table D-7 Alignment maturity index by category**

This response comes from 2 interviewees as stated. The IT Management response is consistently higher than the Senior Management response. If an average is taken of these views, the proposed alignment maturity level is 1.82. The areas where there is a  $\geq 2$  point rating difference are shown in bold-type in Table D-8.

<b>Q1.2 Alignment Maturity</b>			
<b>Categories and Issues</b>		<b>Users</b>	<b>IT</b>
<b>1. Communications</b>			
1.1	Understanding of business by IT	2	4
1.2	Understanding of IT by business	2	1
1.3	Inter/intra-organisational learning	1	2
1.4	Style and ease of access	N/a	4
1.5	Knowledge sharing/leveraging intellectual assets	1	3
1.6	IT staff/business liaison	1	1
Average		1.4	2.5
<b>2. Competence/Value metrics</b>			
2.1	IT metrics	1	2
2.2	Business metrics	1	1
2.3	Link between IT and business metrics	1	3
2.4	Service level agreements of IT function	1	2
2.5	Benchmarking	1	3
2.6	Formal assessment / reviews of IT investments	1	2
2.7	Continuous improvement practices	1	2
Average		1.0	2.1
<b>3. Governance</b>			
3.1	Formal business strategic planning	1	2
3.2	IT strategic planning	1	3
3.3	Organisational structure	1	3
3.3	Reporting relationships	3	3
3.4	Budgetary control	1	1
3.5	Rationale for IT spending	1	2
3.6	Steering committee	1	2

Categories and Issues		User	IT
<b>3. Governance ctd</b>			
3.7	Prioritisation process	1	1
Average		1.3	2.1
<b>4. Partnership</b>			
4.1	Business perception of IT value	2	1
4.2	Role of IT in strategic business planning	1	3
4.3	Shared goals, risk, rewards/penalties	1	1
4.4	Managing the IT-business relationship	4	2
4.5	Relationship / trust style	2	2
4.6	Business sponsor/champion	N/a	3
Average		2.0	2.0
<b>5. Scope and Architecture</b>			
5.1	Primary systems	1	1
5.2	Standards articulation	N/a	3
5.3	Architectural integration: Systems across the organisation	1	3
5.4	Architectural integration: Architectural transparency, flexibility	2	4
Average		1.3	2.8
<b>6. Skills</b>			
6.1	Innovation, entrepreneurship	N/a	3
6.2	Key IT HR decisions made by	N/a	1
6.3	Change readiness	1	2
6.4	Career crossover	N/a	1
6.5	Education, Cross-training	2	2
6.6	Social, political, trusting environment	2	3
6.7	Attract and retain top talent	1	1
Average		1.5	1.9
Overall Average		1.4	2.2

**Table D-8 Maturity index in detail (Points of divergence)**

Given the comments on strategic planning in the previous section, the scores for the 2 items concerning planning are interesting: the administration view is different from the IT Management view and coincides with the perception of low to no involvement already mentioned above. The low score of understanding of business by IT points to an area of concern.

The disagreement between the two respondents on linking with business metrics is strange as there is no organisational system in place as yet, and thus the IT Management's rating as a 3 is not clear and possibly points to a misunderstanding of the question. IT and Administration agree on the level of partnership.

## ***D.7 Implementation and monitoring***

Once strategies are established, their implementation and monitoring is important, as well as measures of how well the implementation is supporting the needs of the organisation. A Balanced Scorecard System is being instituted for the whole organisation, and IT will also have their targets and be monitored. Interviews and scaled down surveys were used to collect users' views of service with respect to information provision, especially as related to the specific information needs of groups of users, and their ability to gain needed information from the information systems. The opportunity for making administrative processes more transparent would be very useful in locating of bottlenecks and enhancing accountability.

## ***D.8 Support for tactical, management needs***

### **D.8.1 IT support for management decision-making**

As described, the University operates in three modes: autocratic/centralised which may be equated to managerialist, bureaucratic, and aspiring to a third mode of entrepreneurship (which bypasses the typical bureaucratic University processes). This mode mixture is a difficult mode to coordinate without loss of confidence in transparency and efficiency. The difficulties posed by committee decision-making have already been mentioned. How does IS/ICT support this? An ERP system can support a centralised system admirably as there



should be sufficient quality management information to support informed decision-making. This system is in place, but not operating optimally at present. Reasons for this are that the hardware and communication infrastructure is relatively new, and that there were originally limited licenses so that only approximately 90 users were allowed to access the system (these were mainly administrative and management users). Levels of computer literacy on the system are not high, and the system itself is (as many Enterprise Systems) not easy to use. Word-processing and email for generation and communication of documents are used, but there is no evidence of other IS/ICT usage to support improving the transparency and efficiency of committee decision-making. The entrepreneurial aspect should be supported by the need to be flexible, with devolution of decision-making and information available at all levels. The systems operating outside the main system in the semi-independent Institutes and Units did in most cases allow for this type of flexibility, but because of problems with controls in these processes, the systems are now being brought back into the University structures. There are obstacles to efficient decision-making, but it would appear that the processes themselves are the culprits, rather than that the ERP system is limiting flexibility and speed.

### **D.8.2 Academic management**

Information for academic management needs can be obtained through intermediation by the consultant who handles the ITS<sup>©</sup> system. Budget information used to be impossible to obtain, but can now be accessed directly from the system. Originally few academic “managers” (HoDs and Deans) had access to the system as there were limited licenses, but this has now changed. (Deans were asked to write letters requesting access for consideration by the Registrar). The system is not a user-friendly system, so despite now having access (without having to specifically request access), intermediation is still required for information such as comparisons on pass rates for modules, for example. Such needs are met by the University Planner, on an irregular basis. The Planner however is concerned about the quality of the data held from which to draw information.

## D.9 Support for core operations: Teaching and research

It is a battle to maintain the physical venues on the Alice campus in a state conducive to teaching regarding basic infrastructure (desks, lights, fans and whiteboards – some venues still have blackboards). General maintenance has been a problem. The two smaller campuses have better infrastructure that has been better maintained. Technology support for teaching is thus minimal on the main campus, whereas the two smaller campuses have good to excellent facilities (although there has been a spate of thefts at the city campus which have disrupted teaching with technology).

The Teaching and Learning Centre is in the process of providing eLearning support, but thus far to a limited extent. A pilot project was started in 2005 and five pilots are running in 2006 using WebCT<sup>®</sup> or Moodle (an open source system) to enhance contact teaching in order to evaluate what system to recommend for general use (Woods, 2006).

The diagram for the core operations is reproduced (Figure D-5 from Figure 6-9):

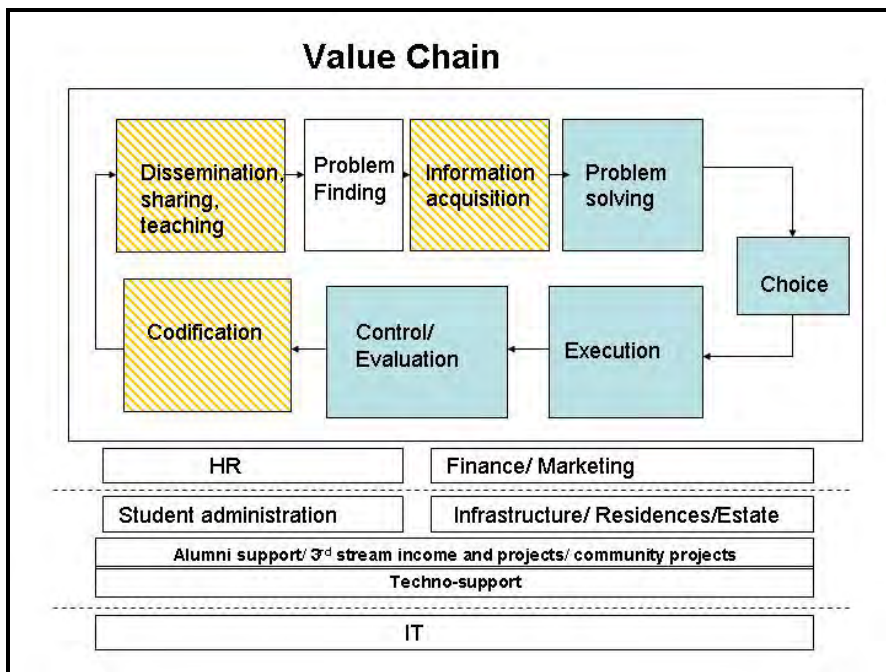


Figure D-5 Core value chain processes

### ***D.9.1.1 Problem finding***

Email is reasonably robust at the time of writing (although a three week break in external Webmail access does somewhat contradict this statement). However, most of the teething problems have disappeared. Email thus supports problem finding.

### ***D.9.1.2 Information acquisition***

The web is the major source of IS/ICT supported information acquisition. However, the random slowness of access makes this a source of irritation and hinders efficiency when it happens. The library hosts various electronic databases, which provide a rich source of information.

### ***D.9.1.3 Codification***

Capturing of lecture content is done to a very limited extent by certain departments. This of course also hinders knowledge sharing and dissemination.

### ***D.9.1.4 Dissemination***

WebCT<sup>®</sup>, a course management system, is used in certain courses. Its use is limited mainly to email discussion with lecturers and publishing of lecture slides. It is used successfully (if not exploiting the technology fully), and the feeling is that it should be used more widely and fully. With the introduction of a new campus, the use of email to communicate with colleagues across campuses is a logical conclusion, but the lack of response to email communications has been a major obstacle to the use of the medium (as well as the initial constant interruptions to the service, which has however now settled down admirably).

Research dissemination facilitated by IS/ICT is low except for email where NRF reports, deadlines and other research information is circulated widely (and in large volume). Work in progress and published research is not available. Details of the Research Centre do not feature on any University web pages, although the Director is in the process of putting this in place. The library comes out as a shining example of the use of technology to support research. Otherwise IS/ICT research support is low.

#### ***D.9.1.5 Control/evaluation***

Not enough use of IS/ICT is being made for feedback loops although the new Balanced Scorecard initiative as supported by IS/ICT will be an example of such a loop.

### ***D.10 Support for support functions***

IS/ICT may not yet be being used optimally to improve the service provided, but training and reengineering is ongoing.

### ***D.11 Quality of IT management***

#### **D.11.1 Structure and management**

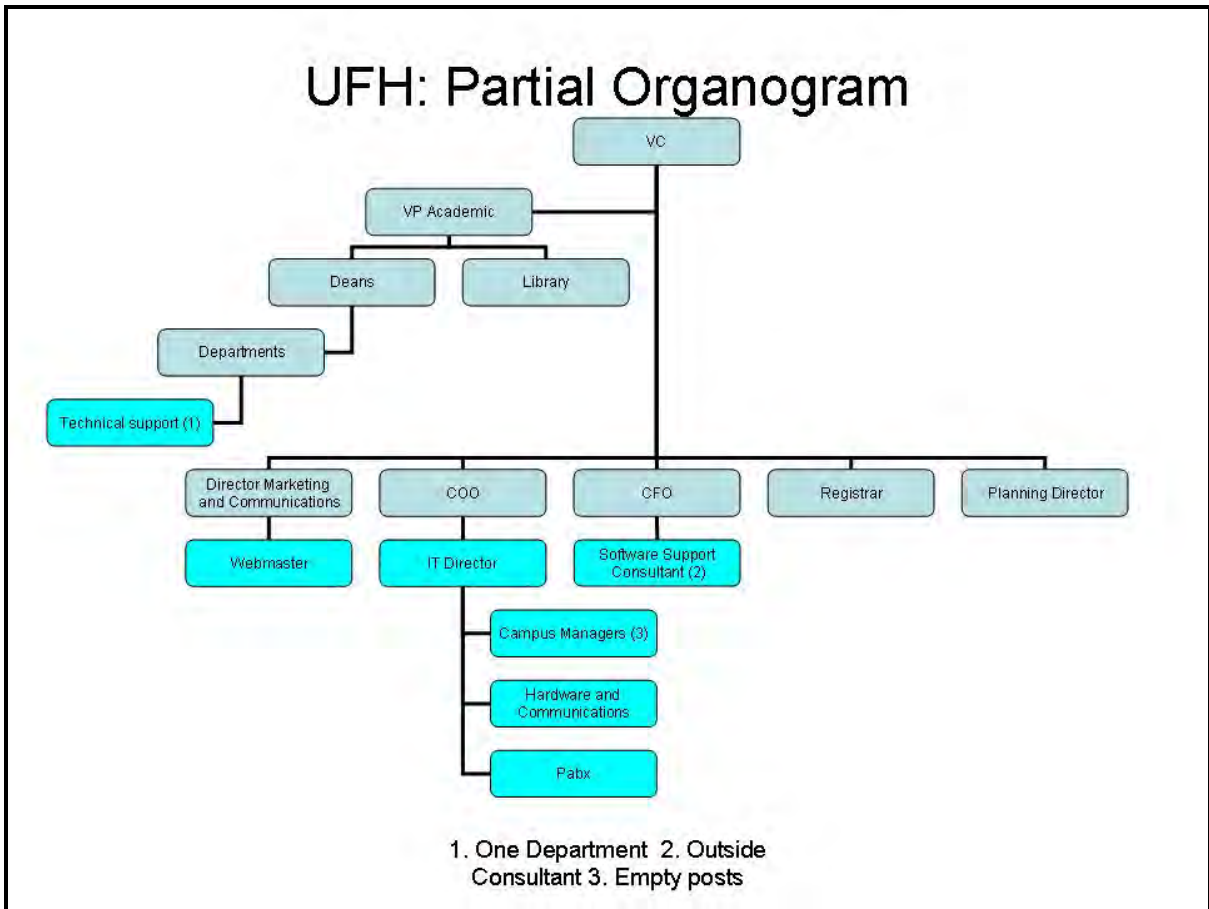
##### ***D.11.1.1 Structure***

A partial organogram relating to the IS/ICT functions and units is shown in Figure D-6. The IT Director reports to the newly instated Chief Operations Officer (COO), and the IT Division manages the information technology, that is, communications (networks and PAAB), mail-servers and web access as well as help desk and user support and common applications. The IT staff also maintain the public laboratories and servers.

The position of Software Manager as such does not exist, although the brief of the IT Director does seem to cover this (see strategies in Section D.5.4). The ITS<sup>®</sup> system is maintained by an outside ITS<sup>®</sup> consultant, and this is relatively costly.

The University Planner provides high-level information for strategic planning, and is responsible for providing HEMIS data.

This organogram does not approach that suggested for large HEIs.



**Figure D-6 UFH - IT related organogram**

#### ***D.11.1.2 Staffing***

A new IT organogram has been constructed, but there are still many staff vacancies for critical posts. The number of staff posts available is 22 of which 13 are vacant (SAd, 2005). The IT Director bewails the lack of skills. Challenges facing the Directors are echoed in Bosire's Survey, 2003 – Appendix A (Bosire, 2003) such as salaries for staff, staff retention, and skills development.

The incorporated city campus staff report to the IT Director. Appointment of a campus-specific IT manager has been delayed and this has caused morale problems. The web is part of the brief of the Marketing and Communications Division and the development has been outsourced.

The Library's IT budget is totally separate and the Chief Librarian reports to the Deputy Vice-Chancellor.

### ***D.11.1.3 Budget***

The budget was seen as a “challenge” in Bosire’s Survey, 2003 – Appendix A. However, a lot of energy is expended successfully in attracting external funding for particularly laboratories, and merger funding for the IT infrastructure has seen the establishment of a potentially very good IT infrastructure. The merger funding has been essential for connecting the three campuses. As stated above, the budget is very low as a percentage of the total budget, but this could be explained by the context of a University in a financial turnaround stage and is changing.

## **D.11.2 Management and governance**

### ***D.11.2.1 Service level agreements***

According to the IT Director, service level agreements on access to data exist. This is not published, however, and IT staff are not aware of any such agreements (Ad, 2005).

### ***D.11.2.2 Committees and meetings***

No IT steering or Advisory Committee was in place before the incorporation of the city campus. The city campus had an informal IT committee which had served originally as a sub-committee of the IT steering committee of the previous mother University (RU). The IT committee acted as a central campus body to decide on priorities for the IT Department on the campus. It was chaired by a senior academic and was composed of senior academics from all Faculties, senior administration and student representatives and, of course, the campus IT manager. It served to support the IT manager on the campus as well as to reflect academic areas of concern. Issues arising from these meetings were fed to the central University IT Steering committee.

With the incorporation, the IT Director became a member of the Committee. However, almost simultaneously, the position of IT campus manager became vacant and has stayed that way. The IT Director was unhappy with a campus-specific body. On incorporation, the

Committee was not reformulated as an official University Committee, and therefore fell into abeyance.

An institutional information management committee was instituted, especially to look at information provision on the web, but has met very rarely, and then under changing leadership. It has not met this year (SAd, 2005).

The IT Director is, however, a member of the University Executive Management Committee, where such IT issues may be aired.

### ***D.11.2.3 Policies***

The IT Director views privacy of information and security of information as important.

The IT Division sets up policies for IT related issues guided by TENET policies (IT Mgm, 2004, (Tenet, 2005). (An excerpt from the TENET website has been repeated in Appendix F). Policies “are in progress and being implemented:” (IT Mgm, 2004). For Fort Hare, these policies were devised in 2003 and an example is the Acceptable Usage Policy (AUP) (IT Mgm, 2004). From a circulated document regarding all University policies, the following ICT policies were mentioned as completed and approved in December 2004 by the Executive Management Committee:

- Information Security Policy
- Web Site terms and conditions
- E-Communication Policy
- Email disclaimer
- Acceptable usage policy (AUP)
- Internet usage policy.
- An IP Manual is being drafted.

However, the AUP has only recently been published in laboratories. Furthermore, some IT staff are not aware of other policies at the time of writing (Ad, 2005).

#### ***D.11.2.4 Charge out policy***

No charge out costs are applied to academic or support units. However, the ICT Strategic Plan (UFH, 2003b) recommended a cost recovery plan by charging for services such as maintenance, Internet usage charge, and connectivity to the network. Students on the city campus are levelled an IT usage fee depending on the courses that they are taking (Information Systems students are levied an extra fee.) Achieving a common fee structure for the whole (newly merged) University is in progress. No charge is levied for bandwidth usage and bandwidth management is difficult as the software to manage this is expensive and has not been purchased.

#### ***D.11.2.5 Security and disaster recovery***

Network redundancy has been built into the architecture. This is not “total end-to-end” redundancy, but the objective is high availability of services. The aim is to provide, for example, email stability by enabling mail to be retrieved at one of the other two campuses if the email server on the main campus is down (ICT Strategic Plan, UFH, 2003b).

However, the existence of a disaster recovery plan is not in evidence, and on the city campus no backups are being made, and the UPS lasts for no more than an hour. The electricity supply in Alice is variable, but the University has generators, so power is assured there.

### ***D.12 Quality of IT Service***

#### ***D.12.1 System quality***

A survey was undertaken on the main campus in 2005 to assess the quality of technology and systems. The results are shown in Table D-9. This survey was not repeated at the other case HEIs. This survey was undertaken to get a broader view of IS/ICT provision, as the detailed questionnaires were proving difficult to complete. The question asked was “Please rate the following categories in terms of the quality of IS/ICT provision, in your experience”.

Respondents: 2 Senior Academics, 2 Senior Administrators, 4 Students on the Alice campus, the IT Director, as well as an administrative staff member from the Fort Hare Institute of Government.



Rating Scale: 1 to 5 where 1 = “Poor” and 5 = “Excellent”.

<b>Q2.5 Technology and Systems Quality</b>						
	<b>User Category</b>					
<b>Category</b>	<b>Senior Admin</b>	<b>Academic</b>	<b>Student</b>	<b>Over-all User</b>	<b>IT Mgm</b>	<b>Admin (FHIG)</b>
Quality of technology in support of learning	2.0	3.0	1.8	2.3	3.0	4.0
Quality of on-line support for student admin	2.5	3.0	2.5	2.7	1.0	5.0
Quality of information systems to support	2.5	4.0	2.5	3.0	4.0	4.0
General IT provision	3.0	3.0	1.8	2.6	4.0	4.0
Library Systems	3.5	3.0	1.8	2.8	4.0	4.0
Support for informal information needs	2.5	3.0	3.0	2.8	3.0	5.0

**Table D-9 Technology and Systems Quality**

IT Management is critical of the support for eLearning at the time of the survey, but progress is being made in this regard.

Generally, students appear neutral to negative on the questions. General IT provision is viewed negatively as well as eLearning facilities and the library. Much of their response can be ascribed to inadequate and poorly maintained open laboratory facilities. Student representation was made to faculty to complain about open laboratory conditions and access to the intra- and Internet (SAc, 2005), and this still needs attention (SAc, 2005).

The FHIG respondent appeared much happier, and this is ascribed to the fact that the Institute was running their own server with dedicated IT staff support. Because this user was using different systems, the response is not aggregated with the other users.

The Library systems rated highly except for student ratings and this could well, as stated above, be ascribed to the limited access to intranet facilities.

Interestingly, despite the negative reports about academic management support, academics rated this category highly. This is hard to explain.

### D.12.2 Service quality

The quality of the service provided by the IT Division was next examined. The Servqual instrument was applied to a small group of staff and students and also used as a basis for interviews. The results from the questionnaire are shown in the next three tables. The instrument is constructed to allow for respondents to reply to “Ideal”, “Possible” and “Actual”. Table D-10 categorises responses by types of users for “Actual” service.

Respondents: 2 Senior Academics, 2 Administrative Staff, the IT Director, and 5 students from the main campus.

Rating scale: 1 to 7 where 1 = “Poor” and 7 = “Excellent”.

<b>Q2.4 Servqual – Alice campus</b>					
<b>Actual Service provided</b>	<b>User category</b>				
	<b>IT</b>	<b>Studen</b>	<b>Academi</b>	<b>Admin</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	4.0	2.2	3.5	3.0	2.9
Perform the service right the first time	4.0	2.0	4.0	3.0	3.0
Inform users when request can be completed	5.0	3.8	3.5	3.5	3.6
Inform users regularly about the status of users' requests	5.0	2.0	2.5	2.0	2.2
Provide services at the time they promise to do so	4.0	2.8	1.0	2.5	2.1
Average	4.4	2.6	2.9	2.8	2.8
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	5.0	3.4	2.5	5.0	3.6
Give prompt service to users	4.0	2.4	2.0	4.0	2.8
Always be willing to help users.	4.0	2.8	2.0	3.5	2.8
Never be too busy to respond the users' requests	3.0	2.8		4.0	3.4
Average	4.0	2.9	2.2	4.1	3.0
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	4.0	2.0	1.5	4.0	2.5
Be consistently courteous with users	4.0	1.4	2.5	4.0	2.6

<b>Actual Service provided</b>	<b>User category</b>				
<b>Assurance ctd</b>	<b>IT</b>	<b>Studen</b>	<b>Academi</b>	<b>Admin</b>	<b>User</b>
Have the knowledge to answer users' questions	4.0	2.6	2.0	3.5	2.7
Average	4.0	2.0	2.0	3.8	2.6
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	4.0	1.8	2.0	4.5	2.8
Have employees who give you personal attention	4.0	2.2	2.5	5.0	3.2
Have the users' best interests at heart	3.0	2.0	3.0	4.5	3.2
Understand the specific needs of their users.	4.0	2.2	2.5	4.5	3.1
Average	3.8	2.1	2.5	4.6	3.1
Overall Average	4.0	2.4	2.4	3.8	2.9

**Table D-10 Servqual Actual service by category of user**

As can be seen, IT and Administrative staff view the actual provision similarly (in this small sample). Students and Academics are considerably more negative.

Table D-11 shows the perception of what the possible services could be, and is an indication of where there may be resource problems.

<b>Q2.4 Servqual – Alice campus</b>					
<b>Possible Service Provided</b>	<b>User category</b>				
	<b>IT</b>	<b>Student</b>	<b>Academic</b>	<b>Admin</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	7.0	4.7	5.0	5.5	5.1
Perform the service right the first time	5.0	5.0	5.5	5.5	5.3
Inform users when request can be completed	7.0	5.7	4.0	6.5	5.4
Inform users regularly about the status of users' requests	7.0	4.7	4.0	6.5	5.1
Provide services at the time they promise to do so	5.0	5.7	6.0	5.5	5.7
Average	6.2	5.1	4.9	5.9	5.3
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	6.0	5.0	6.0	5.0	5.3
Give prompt service to users	7.0	3.8	5.5	5.5	4.9
Always be willing to help users.	7.0	5.3	6.0	5.5	5.6
Never be too busy to respond the users' requests	5.0	5.3		5.5	5.4
Average	6.3	4.8	5.8	5.4	5.3
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	7.0	5.3	6.0	6.0	5.8
Be consistently courteous with users	5.0	5.8	6.0	6.0	5.9
Have the knowledge to answer users' questions	3.0	5.0	6.0	6.0	5.7
Average	5.0	5.3	6.0	6.0	5.8
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	7.0	6.0	5.0	5.5	5.5
Have employees who give you personal attention	7.0	5.3	5.0	5.5	5.3
Have the users' best interests at heart	5.0	5.8	6.0	5.5	5.8
Understand the specific needs of their users.	6.0	5.8	6.5	5.0	5.8
Average	6.3	5.7	5.6	5.4	5.6
Overall Average	5.9	5.2	5.6	5.7	5.5

**Table D-11 ServQual - Possible Service**

This “Possible” table shows that IT management and users’ perceptions of what is possible are similar, with IT Management perceptions slightly more optimistic.

The gap between what is possible and what is actually delivered is shown in Table D-12:

<b>Q2.4 ServQual – Alice campus</b>		
<b>The Gap: Possible - Actual Service Provided</b>	<b>User</b>	
	<b>IT</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>		
When promising to do something by a certain time, will do so	3.0	2.2
<b>Perform the service right the first time</b>	<b>1.0</b>	<b>2.5</b>
Inform users when request can be completed	2.0	1.1
Inform users regularly about the status of users' requests	2.0	2.4
<b>Provide services at the time they promise to do so</b>	<b>1.0</b>	<b>2.8</b>
Average	1.8	2.2
<b>Responsiveness: Excellent information services will</b>		
Have operation hours convenient to all their users	1.0	1.5
<b>Give prompt service to users</b>	<b>3.0</b>	<b>1.6</b>
Always be willing to help users.	3.0	2.3
Never be too busy to respond the users’ requests	2.0	2.6
Average	2.3	2.0
<b>Assurance: Employees in excellent information services will</b>		
Instil confidence in users by their behaviour	3.0	2.9
<b>Be consistently courteous with users</b>	<b>1.0</b>	<b>3.0</b>
<b>Have the knowledge to answer users' questions*</b>	<b>-1.0</b>	<b>2.1</b>
Average	<b>1.0</b>	<b>2.7</b>
<b>Empathy: Excellent information systems employees will</b>		
Give users individual attention	3.0	2.9
Have employees who give you personal attention	3.0	2.1

<b>Empathy ctd</b>	<b>IT</b>	<b>User</b>
Have the users' best interests at heart	2.0	2.6
Understand the specific needs of their users.	2.0	2.6
Average	2.5	2.6
Overall Average	1.9	2.4

**Table D-12 ServQual - The Gap - main campus**

An area where IT has outperformed is shown\* (that is, where the actual is estimated as higher than the possible, by IT however). Issues with a difference of > 1 between the groups of respondents have been bold-typed

Subsequently (September 2005) the city campus was subjected to the same Servqual survey. The results are shown in the next three tables.

Respondents: 1 Librarian/administrative staff, 1 Student, 2 Academics, and 1 IT staff member.

Rating scale: 1 to 7 where 1 = "Poor" and 7 = "Excellent".

<b>Q2.4 ServQual – East London Campus</b>					
<b>Actual Service Provided</b>	<b>User category</b>				
	<b>IT</b>	<b>Academic</b>	<b>Admin</b>	<b>Student</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	6.0	6.0	6.0	7.0	6.3
Perform the service right the first time	5.0	5.5	6.0	7.0	6.2
Inform users when request can be completed	6.0	5.5	7.0	6.0	6.2
Inform users regularly about the status of users' requests	6.0	4.5	5.0	5.0	4.8
Provide services at the time they promise to do so	5.0	6.0	6.0	7.0	6.3
Average	5.6	5.5	6.0	6.4	6.0
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	1.0	5.0	5.0	6.0	5.3

Actual Service Provided	User category				
	IT	Academic	Admin	Student	User
<b>Responsiveness ctd</b>					
Give prompt service to users	5.0	5.0	7.0	7.0	6.3
Always be willing to help users.	7.0	6.0	7.0	7.0	6.7
Never be too busy to respond the users' requests	5.0	5.0	6.0	4.0	5.0
Average	4.5	5.3	6.3	6.0	5.8
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	5.0	6.0	7.0	7.0	6.7
Be consistently courteous with users	5.0	6.0	7.0	6.0	6.3
Have the knowledge to answer users' questions	5.0	6.0	6.0	6.0	6.0
Average	4.9	6.0	6.7	6.3	6.3
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	5.0	7.0	7.0	5.0	6.3
Have employees who give you personal attention	5.0	7.0	7.0	5.0	6.3
Have the users' best interests at heart	7.0	6.0	7.0	4.0	5.7
Understand the specific needs of their users.	7.0	6.0	7.0	7.0	6.7
Average	6.0	6.5	7.0	5.3	6.3
Overall Average	5.2	5.8	6.5	6.0	6.1

**Table D-13 Servqual - City campus Actual**

Interestingly, the IT Manager sees the “actual” service provision lower than do the users.

Next what the city campus sees as possible is shown:

<b>Q2.4 ServQual – East London Campus</b>					
<b>Possible Service Provided</b>	<b>User category</b>				
	<b>IT</b>	<b>Academic</b>	<b>Admin</b>	<b>Student</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	6.0	6.0	6.0	5.0	5.7
Perform the service right the first time	7.0	6.0	7.0	4.0	5.7
Inform users when request can be completed	7.0	6.0	7.0	6.0	6.3
Inform users regularly about the status of users' requests	7.0	6.0	7.0	7.0	6.7
Provide services at the time they promise to do so	5.0	7.0	6.0	6.0	6.3
Average	6.4	6.2	6.6	5.6	6.1
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	1.0	6.0	6.0	5.0	5.7
Give prompt service to users	6.0	6.5	7.0	6.0	6.5
Always be willing to help users.	7.0	7.0	7.0	7.0	7.0
Never be too busy to respond the users' requests	5.0	6.0	5.0	7.0	6.0
Average	4.8	6.4	6.3	6.3	6.3
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	7.0	7.0	7.0	6.0	6.7
Be consistently courteous with users	7.0	7.0	7.0	5.0	6.3
Have the knowledge to answer users' questions	6.0	7.0	6.0	5.0	6.0
Average	6.2	7.0	6.6	5.6	6.4
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	5.0	7.0	7.0	6.0	6.7
Have employees who give you personal attention	5.0	7.0	7.0	6.0	6.7
Have the users' best interests at heart	7.0	7.0	7.0	7.0	7.0
Understand the specific needs of their users.	7.0	7.0	7.0	4.0	6.0
Average	6.0	7.0	7.0	5.8	6.6



Overall Average	5.8	6.6	6.6	5.8	6.2
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**Table D-14 ServQual - Possible (City campus)**

On the question of what is possible, the reverse perceptions hold: users' views are that more is possible.

The gap between what is possible and what is actually delivered is next shown:

<b>Q2.4 ServQual – East London Campus</b>		
<b>The Gap: Possible – Actual Service Provided</b>	<b>User category</b>	
	<b>IT</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>		
When promising to do something by a certain time, will do so*	0.0	-0.7
<b>Perform the service right the first time</b>	<b>2.0</b>	<b>-0.5</b>
Inform users when request can be completed	1.0	0.2
Inform users regularly about the status of users' requests	1.0	1.8
Provide services at the time they promise to do so	0.0	0.0
Average	0.8	0.2
<b>Responsiveness: Excellent information services will</b>		
Have operation hours convenient to all their users	0.0	0.3
Give prompt service to users	1.0	0.2
Always be willing to help users.	0.0	0.3
<b>Never be too busy to respond the users' requests</b>	<b>0.0</b>	<b>1.0</b>
Average	0.3	0.5
<b>Assurance: Employees in excellent information services will</b>		
<b>Instil confidence in users by their behaviour</b>	<b>2.0</b>	<b>0.0</b>
<b>Be consistently courteous with users</b>	<b>2.0</b>	<b>0.0</b>
<b>Have the knowledge to answer users' questions</b>	<b>1.0</b>	<b>0.0</b>
Average	1.3	0.0

<b>Empathy: Excellent information systems employees will</b>		
Give users individual attention	0.0	0.3

The Gap: Possible – Actual Service Provided	User category	
	IT	User
<b>Empathy ctd</b>		
Have employees who give you personal attention	0.0	0.3
Have the users' best interests at heart	0.0	1.3
Understand the specific needs of their users*.	0.0	-0.7
Average	0.0	0.3
Overall Average	0.6	0.2

**Table D-15 ServQual - the Gap (city campus)**

The asterisked items, are items where the service is actually performed against the odds (The possible rating is lower than the actual rating). The perception of the Gap is smaller than on the main campus, and users and IT appear to be less divergent in their views. Divergence of > 1 has again been bold-typed (allowing for rounding). The “Actual” perceived service levels are lower on the main campus than on the city campus. The reason could be that there is closer interaction between IT and the users on the city campus, given the size of the campus.

#### ***D.12.2.1 Helpdesk***

On the East London campus, email is used to register complaints to the IT staff that are generally very helpful, but are very thinly spread and are not able to get to all the requests. The fact that there is no campus manager adds to the problem as prioritisation of requests is difficult to handle. There are *de facto* 2 IT staff who handle queries from 2000 students and approximately 110 staff members.

On the main campus, from Bosire’s survey (2003, to be found in Appendix A) there was no monitoring of support calls, and no service level agreements with “customers”. This is due to change with the installation of a Balanced Scorecard System for the institution.

The intranet shows a help desk, but it has limited functionality at present.

## ***D.13 Robustness of ICT architecture***

### **D.13.1 Robustness of services and architecture**

The robustness of the service is judged on Internet access and email, as very few users have been using the ERP system directly (this is changing as more access is being permitted).

Many complaints have been made about the email system, although it seems to be far more stable at present. The service has been interrupted and was slow – sometimes taking days to deliver mail. These problems are seen to promptly (within the week), but intermittently recur (Ad, 2005). However, Webmail, or the facility to access email from off campus was recently down, and it took three weeks of badgering for the problem to be resolved (SAc, 2005). One of the problems has been that changes are made, (an example being new filtering that suddenly rejects all outside mail), without notifying users who may be expecting urgent mail (IT Admin, 2004). This has been hugely frustrating. The redundancy that has been built in has thus far not proved to be totally successful.

Internet access is viewed as slow at times, although this appears to have improved (SAc, 2005). Students on the Alice campus strangely enough had a much slower access rate, and when this was coupled with limited workstations to access the Internet, queues developed making a student wait for over 2 hours to try to access the Internet and email (Student, 2005).

Despite the provision of a laboratories(s) on the Alice campus, the only reliable computers seem to be those in the Library, according to students, where the queues are hours long (Students, 2005). Web access is so slow that students spend a long time on the available computers<sup>12</sup>. The library has complained about Internet access. An extreme case exemplifies these hold ups: it was faster for the library to phone another HEI, ask them to source an article on the Internet and then email it to the library, than to try to access it

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<sup>12</sup> This problem appears to be improved but still not wholly satisfactory (SAc, 2005)

themselves (SAd, 2005). This blockage is being given attention<sup>13</sup>. According to library staff, the speed of the web has improved dramatically, although there are still days when it crawls (SAd, 2005).

By contrast, a senior academic stated that the network was far more reliable than before and credit should go to the IT division (SAc, 2004).

## ***D.14 Systems Portfolio***

### **D.14.1 System to support information needs**

#### ***D.14.1.1 Microsoft and Open Source***

The University has opted to be a “Microsoft shop” and have made use of the Microsoft academic licensing. However, a strong feeling prevails that open source solutions should be considered. However, balancing the two initiatives has proven somewhat difficult regarding Office products, and thus far not much progress towards open source software has been made.

#### ***D.14.1.2 ERP systems***

The administrative ERP system in place is ITS<sup>©</sup> (Integrated Tertiary Software) which is used by the majority of HEIs in South Africa. The version used at the time of writing is a green screen version and very user-unfriendly, but version 13 is being implemented which reputedly has an easier interface and more functionality. Speaking to University users at other Universities, it appears to be a powerful system with extensive functionality. However, it is fairly inflexible, and is expensive. According to an advisor to the Government on IT issues for mergers, the costs of setting up ITS<sup>©</sup> from scratch as compared to a commercial Enterprise system would not be very different (Duncan, 2005). The University has an ITS<sup>©</sup> consultant on site to manage the system. This is also expensive, but the expertise does not exist within the IT Department to support the system. Originally access to the ITS<sup>©</sup> systems

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<sup>13</sup> This problem has largely disappeared, although there are still “slow times” (SAd, 2005)

was limited to 90 users, but this has changed with the acquisition of a newer version of ITS, where more users can be accommodated.

The systems that exist for academic purposes appear very rigid. An example of this is that the system cannot allow a module to be run over two semesters. This is quite a strange restriction, especially as Universities have introduced modularisation to allow students to have more flexible curricula and to increase throughput. The system was written initially for Technikons and thus may not suit the needs of Universities as well, for example Technikons have more fixed and rigid course structures. Duncan notes wryly that all enterprise systems are inflexible in some ways (Duncan 2005). Furthermore, the system does not appear to be able to support Academic management such as class mark calculations, for example, when these are composed of different types of assessments with different weightings. At present marks (both class and examination) are fed into the system by hand by administrators, and many transcription errors result, which take a long time to correct. Also difficult to handle are the different categories of students (old RU “pipeline students”, “joint” RU and UFH students, and UFH students who are using some joint venture with Johannesburg University with own courses and rules, and “normal” UFH students) all with different class and examination weightings, sometimes for the same courses.

Many staff members interviewed noted that they had no access to the administrative systems and could therefore not rate them. They obtained their information from intermediaries. Table D-16 reports on the view of 1 senior academic and the IT Director on the usefulness of the ERP system (2004), in the first two columns. Although the senior academic did not state this on the questionnaire, the assumption is that he was an indirect user (used the system through an intermediary). Columns 3 and 4 show responses from confirmed indirect users (1 senior administrator and a senior librarian), and the last column shows the response from one direct administrative user (a departmental secretary) who has been trained on the system subsequently (2005). The latter response is insightful, as this is someone actually using the system. Since the interviews, many more users such as Faculty Managers and Academic Secretaries have been trained on the system.

Respondents: 1 IT Manager, 1 Senior Academic, 1 Senior Administrator, 1 Senior Librarian,  
1 Departmental Secretary.

Rating scale: 1 to 5 where 1 = “Poor” and 5 = “Excellent”.

<b>Q2.3 Use of the Enterprise System</b>					
<b>Issues</b>	<b>Category of user</b>				
		<b>Indirect</b>			<b>Direct</b>
	<b>IT</b>	<b>SAc</b>	<b>SAd</b>	<b>Lib</b>	<b>Ad</b>
Does the system provide you with the precise information you need?	4	1	3	5	3
Does the information content meet your need?	3	1	3	4	3
Does the system provide reports that seem to be just about exactly what you need?	3	1	3	4	3
Does the system provide sufficient information?	4	1	3	4	3
Is the system accurate?	5	1	4	4	2
Are you satisfied with accuracy of the system?	5	1	4	3	2
Do you think the output is presented in a useful manner?	5	1	3	3	3
Is the information presented clearly?	5	1	4	1	3
Is the system user friendly?	4	n/a	3	3	2
Is the system easy to use?	4	n/a	3	3	2
Do you get the information you need on time?	5	n/a	2	3	3
Does the system provide up-to-date information?	4	1	3	3	2
Is the system robust?	4	n/a	2		3
Are the services always available?	3	n/a	3	4	3
Can you tailor the output to your needs?	3	n/a	3	3	2
Is it easy to get the exact information you need?	3	1	3	3	2
Average	4.0	1.0	3.1	3.3	2.6

**Table D-16 Enterprise system supporting information needs**

The views of IT and Administrators are more positive than that of the senior academic and once again points to academic needs not being met.

**D.14.1.3 Other systems**

No other systems were mentioned as being in use, apart from WebCT<sup>®</sup> which is used by two departments (one of which is Accounting – in conjunction with Johannesburg University), as an eLearning system.

**D.14.2 Portfolio completeness**

The systems in place to support the University were next examined based on a tick list compiled from University web sites and other resources. The full questionnaire can be found in Appendix B. Only the IT Director’s answers are recorded. The completeness of each category was estimated by the number of “yes” answers to the full set of systems suggested and is shown as a percentage.

Respondent: IT Director.

<b>Q2.1 Portfolio Comprehensiveness (Percentage)</b>				
<b>Category of systems</b>		<b>Yes</b>	<b>Planned</b>	<b>No</b>
1	Administration needs	81.0	19.0	0.0
2	Student Services	63.2	15.8	21.1
3	Administration services for students	22.2	16.7	61.1
4	Academic needs	14.3	28.6	57.1
5	Library Services	100.0	0.0	0.0
6	IT Management systems & web features and applications	80.0	0.0	20.0

**Table D-17 Portfolio of systems: Percentage completeness of provision**

From the table, the provision of systems to support “Academic Needs” and “Administration services for students” appears very low, while completeness of administrative needs are high.



## ***D.15 Quality of information***

### **D.15.1 Government**

The need to provide for Government statistics was mentioned as an area requiring attention. There were inaccuracies in the information provided by the Registrar's division that made subsidy claims inaccurate. The processes were not effective and the data generation from these processes compounded the problem. This was a serious issue as millions of rands are involved, and is receiving attention.

### **D.15.2 Executive management**

The VC's views were not obtained. However, senior management members stated that their information needs were met by approaching the University Planner, for example.

### **D.15.3 Academics, administration and tactical management**

A senior administrator felt that information needs were not being met, as the information produced was often incorrect and decisions were made on this basis. Some of the data was irrelevant as it was "after the fact" (SAd, 2004). A senior academic stated that Faculty Managers did not use the full functionality of the enterprise system (SAc, 2004). However, more training is being provided on the system, and usage is improving.

A senior academic echoed the problem of data being inaccurate, especially student data where examination lists and results were incorrect (SAc, 2004). This impacts on academic management, firstly by the fact that they need to do constant checking on data and cannot rely on that provided, as well as adding to their workload by trying to correct the data, which often they have supplied in correct form. Some of the problems have arisen because of the merger process where interpreting course codes and class marks was complicated by the different groups of students.

One of the issues mentioned was that there was no automation of the budget (SAc, 2004), but the new CIO has put an automated (spreadsheet based) budgeting system in place, which

although not online, is looking very professional. This will aid the information needs of HoDs and Deans.

Very few academics had access to the enterprise system at the time of interviews, although at the time of writing this has changed. One academic stated that he did not have a workstation so could not in any event have accessed the ERP system (SAC, 2004).

With the process reengineering taking place and the appointment of an Assistant Registrar who has ITS<sup>®</sup> experience, this is likely to change.

#### **D.15.4 Students**

Students on the newly incorporated campus have experienced problems with the information that they can access and have been very vocal about this. Students, for example, have to pay a fee to get a transcript of their academic record, and the information on this has often been incorrect. The problem is not isolated to the new campus - an opinion was voiced that the Alice campus students have the same problems, but are less vocal or critical (SAC, 2004). Once again, the problem has been recognised and the new reengineering thrust will address this – the intention is that by the end of the year, incorporation information issues and process problems should have been resolved.

### ***D.16 Information behaviour: Information and technology “literacy”***

This section explores the levels of information and media literacy in UFH, as this could well determine the need for technology support, as well as influence the level of usage. Use of technology is limited by the ability to use technology. It is also limited by a lack of understanding of the importance of data and quality information, as well as the culture of an organisation or unit on the use of technology. This section estimates the literacy levels of

different categories of the University community, followed by usage and responsiveness of technology<sup>14</sup>.

Information behaviour is suggested as a factor in allowing IS/ICT support. This section examines the organisation’s information behaviour as demonstrated through media usage.

### D.16.1 Literacy levels

Table D-18 indicates perceived literacy levels. The question asked was "what was the estimated level of literacy existing in each category of the University community". The responses were averaged and are shown as a percentage of 3 in Table D-18.

Respondents: 2 Senior Academics, 3 Senior Administrative staff, and 5 students.

Rating Scale: 1, 2 or 3 = “Low”, “Medium” and “High”.

<b>Q3.1 Computer Literacy</b>			
<b>Category</b>	<b>Media/System</b>	<b>Rating</b>	<b>Average %</b>
Admin	Email	2.73	90.9
	Word-processing	2.54	84.8
	Spreadsheet Use	2.00	66.7
	Administration system use	2.10	70.0
	Database queries	1.78	59.3
	Internal Information seeking on the web	1.70	56.7
	External Information seeking on the web	1.70	56.7
	Electronic library usage	1.27	42.4
Academic	Email	2.82	93.9
	Word-processing	2.73	90.9
	Spreadsheet Use	1.82	60.6
	Administration system use	1.40	46.7

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<sup>14</sup> These responses were solicited as a rating scale, as it was felt that they were not achieving their purpose as phrased for the previous case.

	Database queries	1.22	40.7
	Internal Information seeking on the web	1.80	60.0
	External Information seeking on the web	2.30	76.7
	Electronic library usage	1.91	63.6
Students	Email	2.36	78.8
	Word-processing	2.00	66.7
	Spreadsheet Use	1.09	36.4
	Administration system use	1.10	36.7
	Database queries	1.00	33.3
	Internal Information seeking on the web	1.90	63.3
	External Information seeking on the web	2.10	70.0
	Electronic library usage	1.55	51.5

**Table D-18 Perceived literacy levels by group on the Alice campus**

Email literacy is rated high, but with students surprisingly at a lower level than the other two groups. The students also have very low literacy rates for spreadsheet use. Until these figures are compared with the other case studies, it is not possible to comment, other than to say that the results point to a lack of access to computers for students, as already mentioned, as well as the fact that many of these students come from educationally deprived backgrounds. This survey was conducted on the main campus. The fact that staff members have to use intermediaries to get at information must be kept in mind.

### **D.16.2 Media usage**

To assess the use of electronic media, the following question was asked to elicit the importance of electronic media in communication: “How high is your usage of the various media for your work related communication with employee categories within the organisation?”. The responses are shown as the average rating as a percentage of the maximum.

Respondents: 2 Senior Academics, 3 Senior Administrative staff, and 5 students.

Rating Scale: 1 = Low, 2 = Medium and 3 = High.

<b>Q3.2 Media Usage</b>			
<b>Category</b>	<b>Medium</b>	<b>Average</b>	<b>%age of max</b>
Admin	Email	2.2	73.3
	Telephone	3.0	100.0
	Cell phone	1.7	56.7
	Fax	1.9	63.3
	Written communications	2.2	73.3
	Personal contact	2.5	83.3
	Meetings/ conferences	2.2	73.3
	Web	1.3	43.3
Academic	Email	2.5	83.3
	Telephone	2.8	93.3
	Cell phone	2.1	70.0
	Fax	1.4	46.7
	Written communications	2.0	66.7
	Personal contact	2.7	90.0
	Meetings/ conferences	2.3	76.7
	Web	1.6	53.3
Students	Email	1.7	56.7
	Telephone	1.2	40.0
	Cell phone	1.8	60.0
	Fax	1.2	40.0
	Written communications	1.7	56.7
	Personal contact	2.6	86.7
	Meetings/ conferences	1.5	50.0
	Web	1.3	43.3

**Table D-19 Media Usage**

Personal contact and telephone are ranked high for staff, but for students, personal contact was the most used method. Email for academics was also rated high.

### D.16.3 Media effectiveness/responsiveness

The responsiveness of communication by media category (as a surrogate for effectiveness) was assessed with the same respondents. The question asked was, “What percentage of response do you get when communicating with the following categories and using the following media?” (Table D-20).

Respondents: 2 Senior Academics, 3 Senior Administrative staff, and 5 students

<b>Q3.3 Media Responsiveness/ Effectiveness</b>		
<b>Group</b>	<b>Medium</b>	<b>Average %</b>
Admin	Email	80.0
	Office voicemail	51.9
	Cell phone voicemail	56.7
	Written	55.0
Academic	Email	80.0
	Office voicemail	48.1
	Cell phone voicemail	56.7
	Written	71.7
Students	Email	59.3
	Office voicemail	40.7
	Cell phone voicemail	48.1
	Written	51.9

**Table D-20 Responsiveness: effectiveness**

(Voicemail was not included in the previous case, as it does not exist). The estimated effectiveness of email was rated low for students. Despite the high rate estimated for administrative staff, opinions are that responsiveness from senior administration is low (SAC, 2005). Academics, especially on the newly incorporated campus, state that senior management staff members do not respond to email. There is a contradiction here which is not easy to explain. Perhaps the city campus staff's expectations are higher.

#### **D.16.4 Media efficiency**

When asked how prompt the replies were on average in the different categories as a percentage (using the same measurement scale and respondents) as a measure of efficiency, the following results were obtained by averaging the responses:

Respondents: 2 Senior Academics, 3 Senior Administrative staff, and 5 students

<b>Q3.4 Media Efficiency/ Promptness</b>		
<b>Group</b>	<b>Media</b>	<b>Average%</b>
Admin	Email	70.0
	Office voicemail	48.1
	Cell phone voicemail	40.0
	Written	76.7
Academics	Email	76.7
	Office voicemail	63.0
	Cell phone voicemail	63.3
	Written	66.7
Students	Email	48.1
	Office voicemail	40.7
	Cell phone voicemail	44.4
	Written	51.9

**Table D-21 Media efficiency/promptness**

Email promptness was rated highest together with written communications. Student responsiveness was again low. These results are more meaningful when compared to the other case studies.

## ***D.17 Transformation alignment***

As for the previous case, although “transformation” could be dealt with under strategic issues, because of the focus of the report it is dealt with separately. Mergers have forced a transformation of the higher education scene in South Africa. Indeed, the stated purpose of these enforced mergers is to “transform the educational landscape”. The role of IT and its impact is discussed.

### **D.17.1 Transformation**

#### ***D.17.1.1 Mergers: incorporation***

The incorporation process was well planned for. Despite this, inevitable process problems resulted from the complexities of the incorporation, especially regarding academic matters that were not analysed in enough depth in advance (in the author’s opinion). What was not foreseen were the difficulties of course alignment. The complexity of having students in the same class at the same time who were RU pipeline students (thus following a RU curriculum), “Joint” Rhodes and Fort Hare students, also following a Rhodes curriculum in some cases who would graduate with a parchment representing both Universities, and pure Fort Hare students, some of whom had courses being run jointly with the Johannesburg University, was not fully planned for. Alignment of the curricula was more difficult than expected as academics tend to be wedded to what they are used to, and great sensitivities abound about what is the “best” curriculum. There was not enough planning on the course structures required by the ITS<sup>®</sup> system. These process problems put a great deal of stress on academics, as they were called upon by the students to try to resolve issues and were often equally frustrated. (As mentioned, process reengineering is going forward to resolve such issues.)

#### ***D.17.1.2 Merger/ incorporation and data impact***



The impact of IS/ICT on the incorporation was large.

HR data from RU was downloaded on to the ITS<sup>®</sup> system, but this was not successful because of system differences. The data had to be manually reconciled before being entered on the new system. Initially there were also payroll errors which, as in all organisations, are taken very seriously. RU has a defined benefit pension system and UFH did not, and this was a major source of concern especially for the longer-serving staff members.

The main difficulty, however, was course information: the academic structures were not well aligned, and the course structure that was installed did not match the reality of courses that were being offered. The cause of this problem was a lack of consultation with departments and faculty. This has had major downstream implications and problems. Student information was created on the main system, but pipeline students still had to have their results fed back to RU. Another issue was that courses were offered flexibly on the city campus where resources and demands made it possible, but the ERP system was not flexible enough to allow this. The courses had to adapt to the way the system was set up and this, although normal for an ERP installation, did not seem to reflect best practice for the newly enlarged University. Of course, there was also resistance to change on the part of staff at the city campus – people like what they are used to, and there was a great deal more functionality and flexibility available to staff and students on the old system than the new system provided.

The fact that the ITS<sup>®</sup> system has only recently introduced the facility to cater for multiple campuses, has been a drawback in managing the new campuses flexibly.

#### ***D.17.1.3 Other technology***

A common PABX would support a one-campus feel, but is not yet available. VOIP would seem to offer a solution to the cross-campus telephony costs, but this has not been implemented, possibly because there are security problems associated.

Videoconferencing, as already described, is used successfully.

#### ***D.17.1.4 IT support – multiculturalism***

No specific support exists for multiculturalism. The majority of students' home language is arguably Xhosa, but there is little sign of this on the intranet. (Some paper documents and forms are both in English and Xhosa, and the 2005 graduation ceremony programme was printed in both English and Xhosa).

#### ***D.17.1.5 IT support for community projects and third stream funding***

Community involvement is a main thrust of the University. Many projects are being run and Fort Hare derives a competitive advantage from its alumni base and contacts in Government. The Vice-Chancellor has been proactive in creating linkages both nationally and internationally and the Deans have been active in this regard also. The role of IS/ICT here has occurred in the support provided by separate systems for the Institutes and Units engaged in external projects, but management information has not been available for strategic management. These systems are now incorporated into the ERP system with central control.

#### **D.17.2 Communication Management**

This section overlaps with earlier discussions on information behaviour, as well as the less formal aspects of knowledge management. Strategies for communication management do not exist institutionally. The Division of Marketing and Communication (DMC) is in charge of official communications externally and internally. The division does not have a web presence.

As shown in Roets's model for SIPM and the distinction between explicit and tacit knowledge management, IT support for CM needs to be planned for. The two prime vehicles for informal and tacit communications, which ties in with knowledge management above, are email and the web. Videoconferencing is another technology that supports communications as does a functional PABX.

##### ***D.17.2.1 Email***

Electronic communication is vital in a multi-campus HEI. Email is used, but because mail was initially unstable (after incorporation of the city campus) it caused a loss of confidence in its use – many campus students use other email accounts. The city campus academics

reported a lack of response on email sent to senior administrators on the Alice campus, (Ac 2004, SAc, 2005), but as noted this is not reflected in the responses on Q3.3 and Q3.4 from main campus respondents.

Email is, however, an important medium as shown in the tables on media usage (Table D-19; Table D-20; Table D-21). A number of teething problems have been sorted out and it is far more stable at the time of writing. The Directorate of Marketing and Communication are proactive in providing staff with news using email. However, because of the lack of mail groups, and the lack of descriptive subject lines in the Mail, this has also been seen as a source of information overload and irritation, and targeted news would be more effective, if not as inclusive. Everything from “lift wanted” and funerals to academic seminars reach all staff.

#### ***D.17.2.2 Intranet***

The web site has at the time of writing been operational for some months. The webpage has links to other pre-established departmental pages. It is still somewhat rudimentary and is used purely for publishing and not as an interactive medium. The coverage of published material is still thin, but improving. Top Management have been very concerned to get the web site operational, but it is not viewed as a strategic concern. No discussion groups are hosted, and no student or staff portals exist as yet.

More should be done regarding promoting minority interests and forging a common set of values (A common set of values has been work shopped and adopted by the various Committees, but arguably this needs reinforcement). The web is an ideal forum. The web is also an ideal medium for providing discussion groups. This is not utilised. Possibilities for creating shared values electronically are also not being used.

#### ***D.17.2.3 Videoconferencing***

Videoconferencing venues have been set up and videoconferencing has been used successfully for smaller meetings. Chairing such a committee meeting is more taxing, but it has certainly provided an efficient, if slightly less effective, way of running meetings.

### **D.17.3 Knowledge management**

#### ***D.17.3.1 Knowledge Management***

Knowledge management is minimal at present and no explicit knowledge management strategies/practices are in place. The upcoming quality audit will possibly encourage a focus on storing and sharing of course material. Information relating to processes and policies are being captured, but are not yet visible electronically. It was not possible to administer questionnaires Q4.1 (an instrument shown in Appendix E, devised specifically to check KM in HEIs) as respondents stated that they were not conversant with knowledge management. Respondents completed Q4.2 to assess the organisational “ability to instil and promote behaviours and values for effective use of information and knowledge management”. The responses are aggregated in Table D-22 . (Unlike the previous case study, the responses are not shown by user category, as the number of respondents was low).

Respondents: 1 Senior Management, 1 Senior Administrator, 1 IT Director, and an IT Staff member

Rating Scale: 1 to 5 where 1 = “Poor or non-existent” and 5 = “Excellent supported or well-established”.

<b>Q4.2 Knowledge Management /Information behaviour</b>	
<b>Behaviour</b>	<b>Average</b>
An electronic knowledge base exists to store new ideas, knowledge, solutions, and best solutions.	1.3
Documents are proactively shared with employees.	2.3
The development of job documentation is encouraged.	1.3
Information from many sources is stored in an (integrated manner) and cross-referenced, facilitating better communication and decision making.	1.3
No policies or technical security issues prevent the sharing of information and knowledge.	3.0
Documents can be posted on an organisational (intranet) portal or saved on a network server.	3.3

Behaviour ctd	Average
Proactive as members actively seek out and respond to changes in their competitive environment and think about how to use this information to enhance existing and create new products and services.	1.7
Information is transparent as members trust each other enough to talk about failures, errors and mistakes in an open and constructive manner and without fear of unfair repercussions.	2.0
Incentives are in place that motivates staff to share knowledge.	1.7
The generation of new ideas and knowledge is highly valued.	2.7
The information and knowledge you receive is accurate and up-to-date.	3.0
An organisational intranet portal exists where information and knowledge relevant to job requirements may be retrieved.	2.7
It is common practice to store work documents on an organisational server, rather than on personal computers.	2.0
Electronic and/or non-electronic collaboration, teamwork, and cooperation are a part of doing business.	3.3
Information is stored and organised in a way that makes it (intuitively) easy and quick to locate.	1.3
Advanced technologies, (such as data warehousing, mining, and modelling), are used to leverage data and information for strategic and operational decision making.	1.8
Documents stored on an organisational server or intranet contain timely and useful knowledge for our job responsibilities.	1.3
Expert systems and knowledge bases are used to aid in decision making.	1.8
Average	2.1

**Table D-22 Knowledge Management Practices**

As such, knowledge management is not widely practiced (born out by the bold-typed items indicating a score below the 2.5 midpoint level). The overall average is 2.1 which is below the mid level of 2.5. This level is further born out in interview discussions. Certainly there is no strategic focus on KM either at institutional or at IT level.

IS/ICT support for KM in core operations is discussed in Section D.9.

#### **D.17.4 Other changes**

The University complies with student demography targets that are set by Government for racial representation and also complies with the State's open access policy. However, the IS/ICT system is not supporting the latter at present as it is difficult to track which students have been accepted on alternative curricula and indeed what the calculated entry grades (Swedish points system previously described) are for any students. This makes decision-making on acceptances difficult. (This is in the process of being corrected). The new outcomes based school leaving grades will require new ways of categorising students and tracking them.

### ***D.18 In summary***

#### **D.18.1 Context analysis**

Using Porter's "5 Competitive Forces", UFH shows strengths in its management of strong relationships with Government both national and provincial by virtue of its alumni. It has also forged strong links with international institutions keen to either support the HEI that boasts names like Nelson Mandela and other African leaders, as well as with Black Universities in the USA, for example. By virtue of its links with Government, it is often involved in consultancies with especially provincial government – the "Buyer" category.

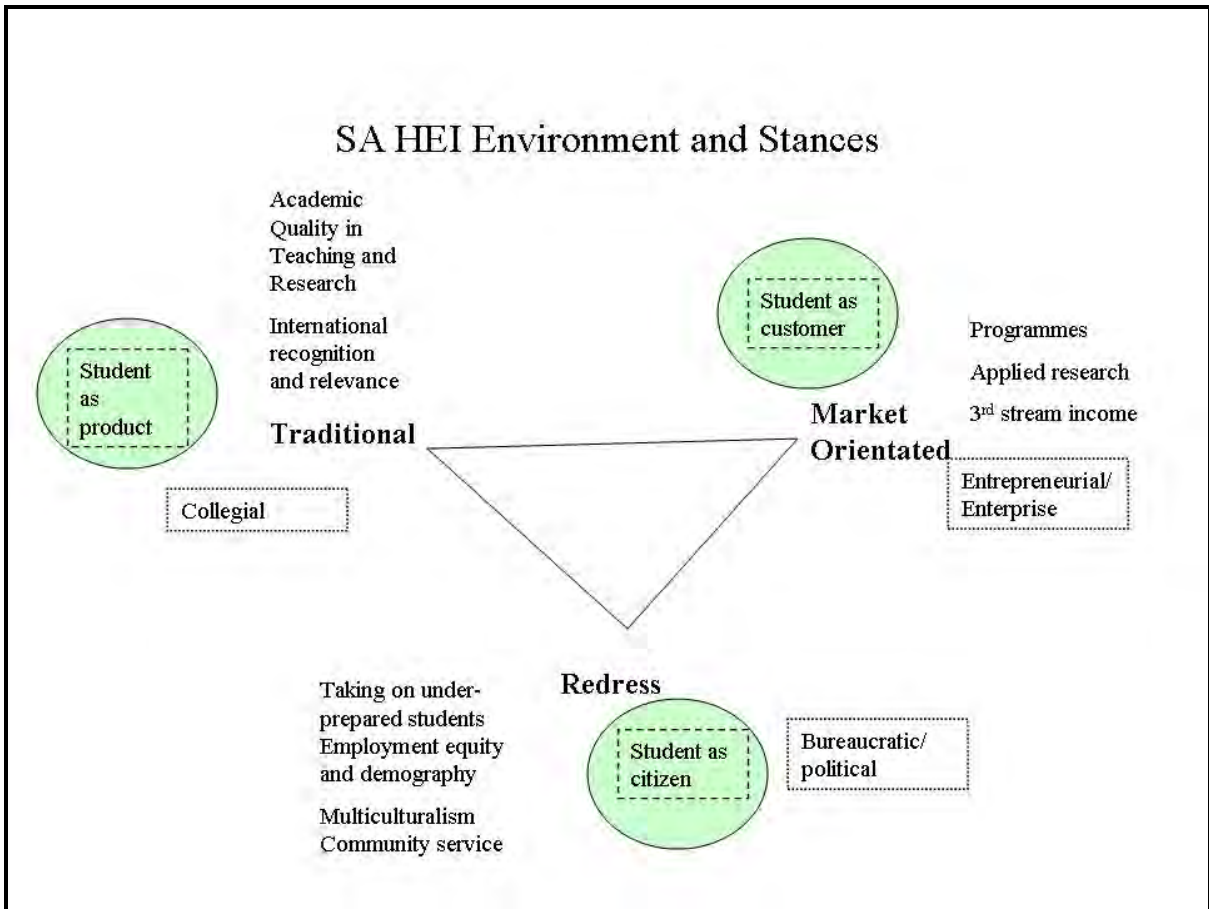
As regards "Suppliers" or suppliers of new students, it has a "captive" group of Zimbabwean students who are offered Presidential scholarships from Zimbabwe to study at UFH and this makes up a large and talented proportion of their students. It struggles to compete with other HWUs for students at present, but there is a momentum building with the growth of the city campus.

Its main "Rivals" for students are erstwhile Technikons in the region, and it has a favoured status in the region in this regard. White students are still suspicious of the quality of the degree. Although the statistics are not readily available, in 2003 the first year class in East London (in CS101 which was a compulsory course for most BCom students) was 47% white. In 2006, the Accounting class was 8% white. This is worrying as an indicator of the Model-C school intake. The group that would normally have registered at the East London campus

opt for studying through nearby Universities like the Nelson Mandela Metropolitan University or Rhodes University, by correspondence (Unisa for example), or through private institutions like Damelin. This is likely to change as the University establishes a more commanding presence in the city, but is a source of concern as the University firmly espouses a multi-racial profile.

“Barriers to entry” for competitors are the limitation by the State on new institutions. Other HEIs especially RU are in general supportive of UFH, especially in the case of departments that were shared with the city campus, although at the strategic level there is arguably competition.

“Substitute products”, that is, the competition for degrees from private institutions is something of a threat especially in the city campus, as the location of the institutions and lack of residential accommodation is similar for the city campus and these institutions, and some students have indeed migrated there when they have become disenchanted with some of the administrative processes at the campus.



**Figure D-7 Balancing competing drives - Roets (2005) – reproduced**

Using the adaptation of Fourie and Fourie’s (2001) diagram (Figure D-7), UFH is balancing between “Redress” and “Market Orientated”, with redress slightly the more dominant motivation.

The University has strategies in place for transformation and is busy operationalising these. The processes are being reengineered and this is vital as there are dysfunctional processes. There is no doubt that the institution is transforming, firstly in order to achieve financial stability, and secondly in the State requirements for transformation. Transformation success, or success of the strategies of transformation, has been estimated by this report. The success of implementation (see D.4.5.7) is largely positive.



UFH is transforming dramatically and is a microcosm of South African changes. The possibilities of using the University as a model of the ideal non-racial society and the transformation processes as a template of how to achieve this is an exciting challenge.

#### **D.18.2 IS/ICT importance**

Despite the stated importance of IS/ICT, this is not supported by budget or the reporting structure. The possibility of using IS/ICT to support transformation has not been fully exploited, and at times, IS/ICT has actually been an impediment to successful transformation through the rigid requirements of the ERP system.

#### **D.18.3 Strategic**

IS/ICT alignment maturity (1.8 – see Table D-7), SIPM and strategic support is low. This is not unexpected given the context. The rigidity of the ERP seems to inhibit the success of the entrepreneurial strategic objectives of the institution by the lack of flexibility. KM and CM as part of SIPM planning is lacking. The quality of the MIS type information to support strategic planning and analysis is dubious.

#### **D.18.4 Tactical**

The University is attempting to operate in a mixed mode. The fact that autocracy and bureaucracy are the main positions for management decision-making may cause a lack of transparency. To operate entrepreneurially the organisation needs to be flexible with devolved responsibility, but the main University systems and processes are rather inflexible, and cause repetitive work, and this makes it difficult for IS/ICT to support flexibility and malfunctioning processes.

There are areas where the existing IS/ICT systems do not support the needs of certain categories of the University community. Student administrative needs (2.7/5 and students' views = 2.5/5 – see Table D-9) are not supported to full potential. For academic management, the inaccuracy of data is at times a cause of huge frustration for staff and students. Table D-9 gives a favourable view of academic and administrative support, but the author's sense is that this is caused by having grouped the two categories together, and this is

supported by responses to the portfolio completeness questionnaire – 14% completeness (Table D-17).

User and IT perceptions about the actual service delivered by the IT Division differ slightly (2.9/7 and 4.0/7 – see Table D-10) and in the case of users is low. This also compares unfavourably with the perception on the city campus (6.1 and 5.2 - Table D-13)

The “enterprise system” can provide for the information needs of the organisation. However, until recently access was limited and intermediation required. It is not an easy-to-use system (in line with other ERPs, but has a great deal of functionality). Academics rate the usefulness at less than average (1.0 out of a possible 5 rating), while administrators rate this at 3.3 for indirect and 2.6 for direct users (see Table D-16), but these ratings may be coloured by the time of the interviews – while the changeover to the new system and greater access was taking place. Portfolio completeness for administration needs is rated at 75% (Table D-17)

The conclusion reached here is that the systems are more geared to support functional support units than academic management. The HR processes themselves are still being criticised, and IS/ICT could provide efficiency and effectiveness support measures to speed up these processes in the form of electronic forms, for example.

The unique managerial structure/mix of HEIs is not particularly well served electronically. Decision-making by committee is slow, and minutes of meetings are not available electronically to speed this up (and save trees). The information for committee meetings is not tailored for individuals to use it effectively.

### **D.18.5 Operational**

Research is not supported by IS/ICT. The infrastructure to support eLearning is not yet operational on the main campus as there are other more pressing needs.

Quality of support in aid of learning is rated at 2.3/5 (1.8 by students – see Table D-9).

The electronic library is, however, providing a good service, with percentage completeness of the systems = 100% (see Table D-17 ). Students (Table D-9) do not rate the quality as highly, but the survey was conducted at the time when there were complaints from students about access to the Internet, which they blamed on the library since those were the only operational public workstations available.

#### **D.18.6 Information behaviour**

The information behaviour of the institution appears to be satisfactory to excellent from the questionnaires (with email literacy 88% and word-processing 81% in Table D-18, responsiveness at 73% for email in Table D-20, and effectiveness at 65% in Table D-21, on average across categories), despite grumbles from city campus staff. However, data quality in terms of data capture and maintenance are at present problematic, resulting in data lacking integrity.

#### **D.18.7 Knowledge and Communication Management**

This appears at a low or non-existent strategic level. Knowledge management is low at present, except in individual departments/units. Informal communications management supported by IS/ICT is limited to email. The KM rating for the institution according to the applied questionnaire is 2.1 (out of a possible 5 - Table D-22)

#### **D.18.8 Transformation**

As described, the University is transforming in many ways. The first phase was focused on a financial turnaround to prevent closure (1999). This caused major changes in staffing, faculty structures and processes. Centralisation of decision making was put in place. The task for the visionary VC was to refocus staff and students from protest action to teaching and learning, to re-examine the academic structure and offerings, and to recover from the financial debt. Task teams were formed comprising staff and academics within and without the institution in order to get commitment to the changes that were being proposed. A strategic plan (SP2000) was formulated. This was a major challenge and the process a remarkable success.

The rate of change at the University has been high. Not only has it had to cope with the incorporation of a culturally alien city campus, but it has also changed its faculty structures again (from 7 faculties to 5: Education; Science & Agriculture; Social Sciences & Humanities; Management & Commerce; and the soon-to-be Faculty of Law) and consolidated these by moving departments from one faculty to another. At the same time it has struggled with an inherited debt (which has now been whittled down to zero).

The Vice-Chancellor, in launching the 90<sup>th</sup> birthday celebrations of the University, further outlined the strategic objectives of the programme as “anchored on (a) Curriculum Renewal and Intellectual Development; (b) Reconnecting alumni to UFH; and (c) Launch of the UFH Centenary Fund”; of which the first is connected to SP2000 and the IOP.

The University is thus going through vast transformation, but the IS/ICT systems do not appear to be exploiting potential areas of support.

## ***D.19 Exploratory areas***

### **D.19.1 IT leadership**

The IT Director has demonstrated leadership in two notable instances: The “Rolls Royce” hardware and network installation can be attributed to the energy of the IT Director in securing funding and in involvement in the project installation. The IT Director also has shown a strong drive to provide “learnerships” for Computer Science post graduates to support users to enable them to gain employment after graduating.

However, the view on IT leadership varies. The IT Director was as involved in setting SP2000 or the IOP as most senior staff members, but not more so. No specific evidence of leadership in using IT strategically exists. This can possibly be attributed to the need to run a division with low staff numbers and skills.

### **D.19.2 Feedback loop**

The use of IS/ICT as a cybernetic control loop for certain academics such as tracking of decisions, and implementation thereof, is not being used, although presumably IS/ICT will be used in managing the BSC initiative.

### **D.19.3 Process reengineering**

As mentioned, the Registrar's Division has embarked on a reengineering process. The document detailing the reengineering process states that procurement of modules for web-based systems and hiring the technical back-up staff with the required ITS<sup>®</sup> expertise is necessary – the use of IS/ICT for reengineering is a given. Training is to be provided to Executive Deans, Faculty managers and other staff, “in view of the ownership of faculty student records and the academic structure” (Mrwetyana, 2005). This move is important regarding the issue of data ownership.

### **D.19.4 South Africa**

The issues facing South Africa in respect of technology have an impact on UFH: the cost of technology is a major hurdle now that the merger funds have been exhausted; attracting and retaining skilled staff is difficult with budget constraints; and bandwidth is a problem. On the other hand, UFH arguably has greater opportunities of attracting funding for equipment and other technology than most other SA Universities and a major effort is now being launched to attract such funding.

### **D.19.5 Achievements**

The implementation of a “state-of-the art” network has been a major achievement of the IT Director.

#### **D.19.6 IT support for change**

The role of IT in “transformation” in terms of Government requirements is low. The HEMIS system’s requirements for good data are not well met at present. As regards responsiveness and flexibility, the systems appeared to be very inflexible.

#### ***D.20 Conclusion***

The University is changing dramatically. IS/ICT support for this transformation is low at present, but has the potential, through a state-of-the-art network, to play a much more meaningful role.

The next chapter examines an institution that is transforming almost as dramatically.

## **Appendix E University of the Free State Case Study**

### ***E.1 Abstract***

UFS is examined using the model/framework proposed. From an organisational perspective, it is found to be in a state of change. It has good strategic management processes in place. In terms of IS/ICT provision, it is found to have areas of excellence, as well as areas which require attention.

### ***E.2 Introduction***

This chapter follows the same outline as the previous two chapters to describe the University of the Free State (UFS). It uses a case study based method to examine and describe the role of IT in supporting the University at both the strategic and tactical/operational levels.

It starts by describing the research method. It continues by describing the context of the University and then looks specifically at perceptions of IT provision. It concludes by summarising these observations.

### ***E.3 Research process***

#### **E.3.1 Case Study**

As in the previous case, the study follows a case study approach using the framework (Figure E-1) through semi-structured interviews, following the protocol (see Appendix E), and limited questionnaire applications as dictated by the proposed model.

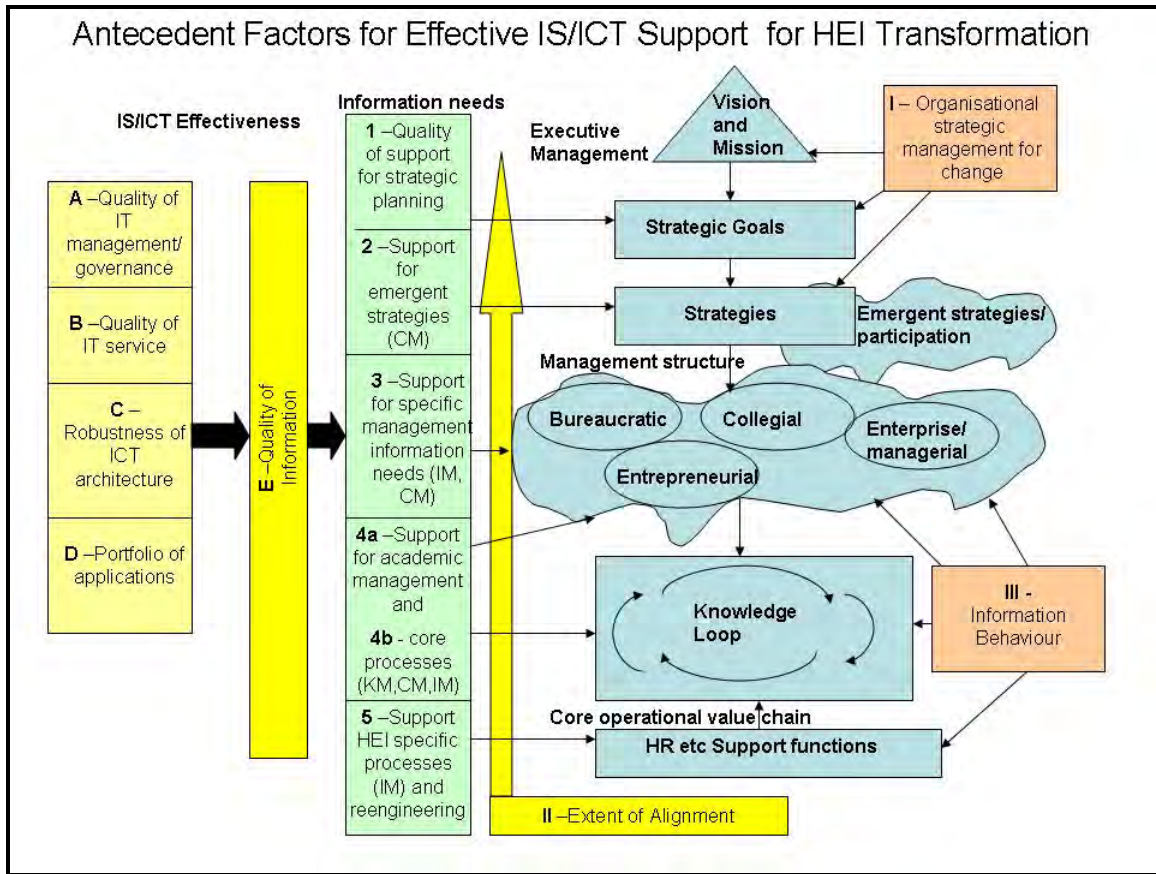


Figure E-1 Analysis Model/Framework

The scales for the questionnaires on Information Behaviour were altered from that of the first case study, for greater clarity (Section E.17).

### E.3.2 Interviews

The main method used was semi-structured interviews. These were all captured by means of recordings and later transcribed, except one where the battery failed and this was reconstituted from notes made during the interview. The interviewer of senior management and academics was the author. Two Honours students from the author's University assisted in the completion of questionnaires for a subset of the respondents. Some questions from the protocol were also asked by them and recorded.



### ***E.3.2.1 Time and place***

The interviews were conducted *in situ* at the University in the last week of August 2005.

### ***E.3.2.2 Respondents***

The Vice-Chancellor (Rector), the Vice-Principal Planning, the Registrar of Strategic Planning, the Chief Financial Officer, the two IT Directors, two academic Deans and one Head of Department were interviewed by the author. The Honours students interviewed or assisted with questionnaires with two senior academics and the University Deputy Director of Library Services, as well as two Heads of Departments and 5 students (one African, as defined in the glossary for black South African, and the other four white South African; 4 undergraduate and one post-graduate). An attempt was made to contact the QwaQwa campus electronically in order to get a reply to some questions and to complete a questionnaire, but no response was received.

A senior UFS staff member helped in setting up interviews and distributed questionnaires prior to the visit as a great courtesy. She mentioned that it had been difficult to persuade people to give up their time, but that the support of the Vice-Principal had made it possible.

### ***E.3.2.3 Protocol***

The protocol used can be found in Appendix B. At times, the conversations veered away from the designated questions, but this is normal with a semi-structured interview. The interviews were recorded and transcribed. The transcriptions were emailed to the respondents, and five responses were received with commentary and corrections. An email and telephonic follow-up was also conducted where there were areas of uncertainty.

### ***E.3.2.4 Ethics***

The interview reports were transcribed from notes and recordings and sent to all respondents. A few responded with amendments and amplification. These were incorporated into the captured interview notes. Individuals are not identified by name, but only by category to retain a level of confidentiality.

### **E.3.3 Questionnaires**

The questionnaires were sent to all the respondents mentioned above, but dependent on their positions, different questionnaires were sent. Some of the respondents completed the questionnaires before the time, but others waited for the time slot and were assisted by the students in answering the questionnaires. Two academics completed the questionnaires after the interviews, where more clarity was obtained on the purpose, and emailed the completed questionnaires to the author. The questionnaires were captured on spreadsheets and aggregated to provide a measure of corroboration for the interviews. The responses are shown mostly in aggregated table format in this chapter.

## ***E.4 The University of the Free State: Organisational context***

### **E.4.1 Overall context**

“The University of the Free State is situated in the heart of the central region of South Africa” (University of the Free State web site). UFS, now a multicultural, parallel-medium (English and Afrikaans) institution, was established in Bloemfontein, capital of the Free State Province, in 1904 as an institution serving predominantly the Afrikaans speaking population of the Free State. A wide range of under- and postgraduate programmes are offered in six faculties, namely Economic and Management Sciences (incorporating a School of Management), Health Sciences (consisting of the School of Medicine, the School of Nursing, and the School of Allied Health Professions), Humanities (incorporating the School of Education), Law, Natural and Agricultural Sciences and Theology.

It serves approximately 25000 students, of which approximately 3000 students are in distance education. The QwaQwa campus of the University of the North was incorporated in 2003, offering BSc, BA, BCom (general) and BEd degrees in various course combinations to 1500 students. The city campus of Vista University was incorporated in 2004. The offerings on this campus are being phased out with no new intake of students, and the students are encouraged to take courses from the main campus curricula, while the future of the site of the campus is being deliberated – mooted is the possibility of using it for a centre for part-time working students (SAd, 2005).

The University, having started as a white Afrikaner University, is now a multicultural University serving all races, and over 50% of the students are Black South African (South Africans of colour as the term is widely if ambiguously used – see glossary). Approximately 50% of the students are Afrikaans speaking (SAd, 2005).

The University struggled with financial viability in the late 1990s and embarked on a turn-around strategy in 1999. Staffing was trimmed and the present staffing budget (total cost to company) is to achieve a level of 65% of the total budget with the ideal ratio of 1.9 academic to 1 administrative post (at senior lecturer remuneration level) (SAd, 2005).

The medical school in particular has enjoyed a good reputation. Growth in student numbers has come about through, specifically, a distance education programme that has been very successful.

#### **E.4.2 Mergers: incorporation**

As mentioned in the previous section, in line with the mergers occurring throughout South Africa of HEIs, UFS incorporated the QwaQwa campus in 2003 and that of the city campus of Vista University in 2004. This has necessitated the merging of course offerings, student records, equalising of fees and Human Resource practices and necessitated cross-campus management.

#### **E.4.3 Structure**

The University is large in comparison to the other two Universities investigated. A faculty is almost as big as either of the two other universities in respect of staff and student numbers. It has the normal University structures of Council, Senate and Faculties, as well as an Institutional forum and normal senate sub-committees, and an executive management committee. It has schools within Faculties, for example, the Faculty of Economic and Management Sciences has a School of Management, and runs programmes within these schools and faculties. The Faculty of Economic Sciences provides programmes such as the Programme in Private Sector Management, Public Sector Management, and Training of Accountants.

The University is headed by a Vice-Chancellor (Rector), assisted by three Vice-Principals – two Academic and one Student Affairs. Two chief directors exist for Community Service and Operations. The executive management committee comprises the above as well as the Registrar: General Secretariat; the Registrar: Strategic Planning; the Director: Physical Resources & Special Projects, the Director: Diversity and the Deans' Representative. Reporting to the Chief Director of Operations are the Director: Finance; the Director: Budgets; the Director: Human Resources; the Director: Computer Systems; the Director: Computer Services, and the Director: UFS Marketing. (UFS website)

UFS operates under a Council and has a Senate with Senate sub-committees, and a well functioning student representative council (SRC), as do the other two SA HEIs. Senate has student and lecturer representation, but membership is otherwise limited to full professors.

#### **E.4.4 Strategic management, vision and mission**

The University engages in formal strategic planning. The University has a 3 year rolling plan which is revised annually.

The mission and vision and strategic objectives are presented on the web site. The VC's annual address on the website sums this up

“Put simply, there are two constants for the UFS:

We will and must always remain a true university.

There will always be change and transformation.” (University of the Free State web site) .

##### ***E.4.4.1 Strategic objectives/change drivers***

It is clear that the vision and mission are well integrated into the planning for the University.

There are five focus areas for strategic objectives:

- “Quality and excellence
- Equity, diversity and redress
- Financial sustainability
- Regional co-operation and engagement
- Outward thrust nationally and internationally” (UFS Website)

Very clear strategies have been crafted to take action on these objectives (UFS website). The focus areas have been clearly communicated as most respondents refer to their impact (SAd, SAc, 2005). The budget is apportioned at institution level according to the strategic objectives. The five focus areas are cascaded down to Faculties and Support Units who are required to provide plans fitting the focus areas and the organisational plan. Faculties' budgets are a ratio of their income.

#### ***E.4.4.2 Emergent change***

UFS used to be a single-language (Afrikaans) institution. It changed to a dual-medium institution with lectures repeated in English. This has had foreseen and unforeseen consequences. Predictably, it expanded the student base. It has also caused a heavier workload for academics. Unpredicted, was the positive result of causing course material to be re-evaluated (and in many cases captured electronically). Additionally, and not as positively, it was found that many Black students gravitated to the English classes, while the white students remained predominantly Afrikaans. This unforeseen language segregation is leading to racial segregation, and is an area of concern for the University, which is striving to form a unified culture in which students "are themselves – 'wees jousef'" (ExMgm, 2005).

Another issue that caused change was the installation of a new ERP system. Change of processes was anticipated, (as will be discussed later), but although this was planned for, the workload and problems related to changed processes were not expected. Staff are now adapting to the changed processes, but still reluctantly in some cases (SAc, 2005).

#### ***E.4.4.3 Success of strategies***

The questionnaire (Q1.1) regarding the importance and success of UFS objectives and strategies was forwarded to senior staff members. However, these were not completed, but discussed during the interviews. From the website, the VC's open and transparent address reports on the success of the last 5 years, and points to areas that are (still) problematic. An excerpt will be summarised in the format of the previous case studies, incorporating statements made by senior staff members in Table E-1.

<b>Q1.1 Strategic objectives and drivers of change</b>		
<b>Drivers of Change</b>	<b>Strategies to achieve goals</b>	<b>Success</b>
Financial stability	Staff rationalisation and growth in student numbers	Successful
Mergers/incorporations	Phasing out of separate Vista campus, management of the QwaQwa campus	Provisionally successful, but the future of the QwaQwa campus is still under examination and operational problems persist.
Massification/ capping	Dual medium and distance education	Satisfactory growth in student numbers
Employment Equity	University wide equity plan to meet Government targets	Planning in process but unsatisfactory progress.
Student Demography	Plan to meet demography targets	Successful, > 60% Black students
Research	Focus on relevant research	An increase in research output and ratings, "More engaged research"
Resource squeeze/ Search for external funding	3rd stream income and IP	Generating an annual surplus; IP income not significant, 3 <sup>rd</sup> stream income 7% of University income
Mixed mode teaching delivery	eLearning – major area	"Numerous new and innovative learning programmes" (UFS website)
Community Projects	Appointment of staff reporting to VC to drive this	" Increasing number of community service modules" (UFS website)
Throughput Rate	Teaching quality	Still problematic
Globalisation/ internationalisation	Strategic planning required	(Unclear from UFS web site)

<b>Drivers of Change ctd</b>	<b>Strategies to achieve goals ctd</b>	<b>Success ctd</b>
Multiculturalism	“Promotion of multilingualism via new language policy (although its application not always easy, requires innovative thinking...); More diverse (‘culturally-representative’) building names; Moshoeshoe project towards a shared sense of history; Multicultural sensitisation workshops; Social contract workshops: building a sense of shared values for a multicultural workplace, to create a sense of belonging” (UFS website).	“But still a strong sense of alienation amongst black staff” (UFS website).
eLearning		(not specifically mentioned)

**Table E-1 Change drivers, strategic objectives and success**

How the University fares against benchmarks on throughput rate and research is not clear from this address. However, there are obvious areas of reported success, particularly in terms of the financial turnaround. ELearning does not feature specifically in the strategic objectives, but a great deal of effort is going into driving this forward for mixed-mode delivery.

#### ***E.4.4.4 Culture***

As a visitor, the University impresses by the courtesy and helpfulness of staff and students, and the low key, enthusiastic and quality approach that it projects. On speaking to both academic and administrative staff, there is a feeling of optimism and energy at the University, of change and improvement.

On the negative side, a mention was made of “administration being seen as the enemy” by lower levels of academics and students. A student stated that administrative response to student requests “was too slow and although server quality could be improved, the main shortcoming was the indifference of staff” and (fairly amusingly) that “computer breaks were really lunch breaks” (Student, 2005). None of the other students mentioned this, although one student stated that most problems were experienced from incorrect data entry: “IT services always efficient, admin on the other hand can be improved” (Student, 2005). However, an academic stated that this “distrust” was more a lack of understanding by academics and students of the functions and requirements of the administrative functions, and that the responsibility was on all sides to improve an understanding of the needs of the other sectors.

#### ***E.4.4.5 Merger: incorporation induced change***

The incorporation of especially the QwaQwa campus has meant a big administrative load on senior staff down to HoD level (SAD, 2005). It is a three hour drive from the main campus, and thus meetings imply a two day absence from the main campus. The incorporation of the two campuses has “raised questions about culture and sustainability” (SAd, 2005). A common challenge mentioned is that of dealing with multiculturalism. This was particularly mentioned by senior staff members.

#### **E.4.5 Students**

The language and cultural diversity of the students has been described (E.4.4.2). There is a functioning SRC, but students, on the basis of some of the interviews, are not overly vocal. In the author’s opinion, UFS did not have a history of student activism under the previous Governments, and this does not seem to have changed. The students encountered on the campus were polite, friendly and helpful.



## **E.4.6 Management and decision-making style**

### ***E.4.6.1 Management style***

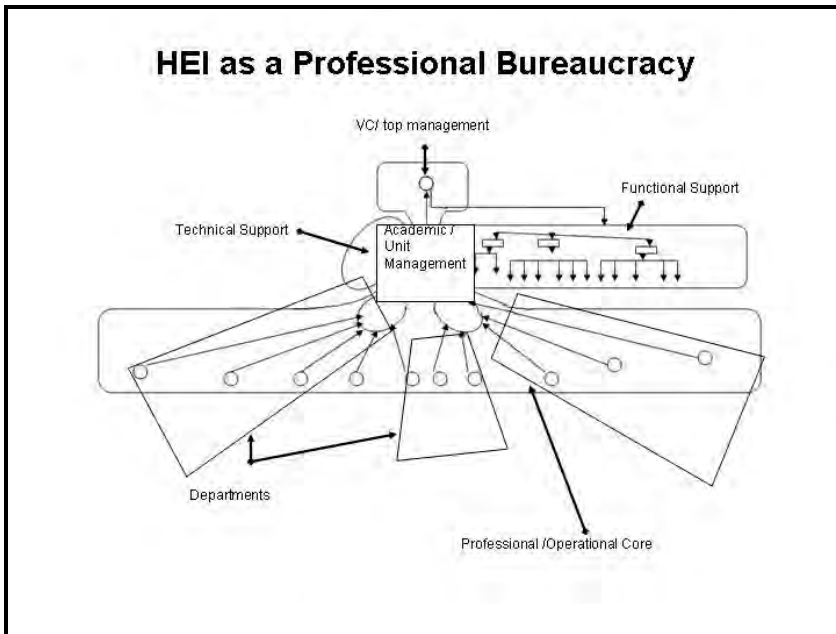
The Vice-Chancellor gives strong leadership. The University appears to be committed to transparency, and the website is an example of this where a large amount of institutional information is freely available.

When asked about the management style with respect to the Dobson and McNay grid, the view was stated that the University has an entrepreneurial approach in order to be an “engaged” University with decentralised management to foster and support a culture of innovation (ExMgm, 2005). As regards accountability, no performance management system is in place, but a system is being developed by external consultants.

Most staff interviewed referred to change as a continuous process at UFS.

### ***E.4.6.2 Management structure***

Using Minzberg’s depiction of a professional bureaucracy (Figure E-2), UFS is similar to UFH in having formal academic management in place with the appointment of executive deans and heads of schools.

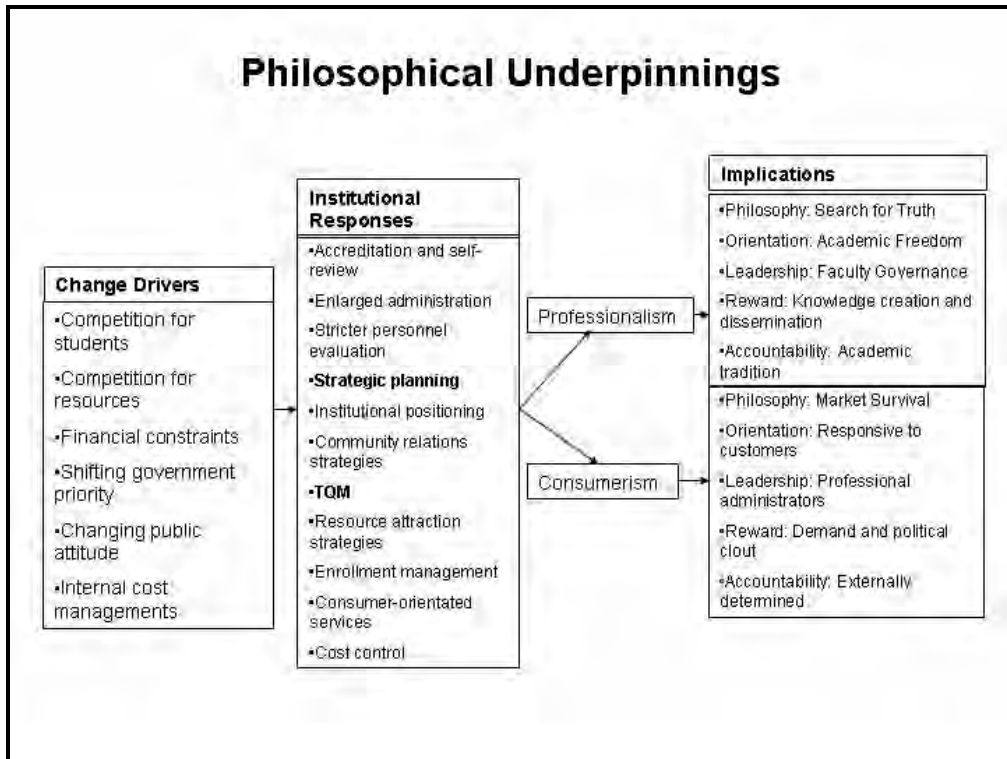


**Figure E-2 Professional Bureaucracy adapted**

#### ***E.4.6.3 Decision-making balance***

Decision-making is decentralised. Whether this leads to more efficient and effective decision-making was not specifically ascertained.

Using Michael's analysis (Figure E-3), UFS can be seen to be balancing between the two approaches (if one can be said to balance between different philosophical approaches!).



**Figure E-3 Philosophical Underpinnings - Michael (1997)**

This was difficult to judge, but the remarks from students in the previous paragraphs are an indication of some problematic areas (E.4.4.3). From the VC’s address, the following was extracted:

- “Operationally / Support services
- Growth in support staff of more than 50 SLEs to 315 (from 263).
- Growth in professionalism of support staff
- Capacity bottlenecks have been addressed and are being addressed ..... (these are instances of some of the “problems of success”...)
- ...
- Registration process in 2005 went exceptionally smooth[ly] due to wonderful team-work”

**Negatives:**

- ....

- Support staff overload
- Still some problems with service orientation
- Staff development still insufficient” (UFS website).

The problem areas highlighted by staff and students are reiterated in this address. Evidently, much has been done to improve processes and support functions. Some problems remain, but the address indicates that Executive Management is aware of problematic areas.

## ***E.5 IS/ICT Strategic management***

### **E.5.1 IS/ICT importance**

Senior staff members and executive management stated that IT was vital for the running of the University, certainly for the day-to-day activities and strategically for “assisting in aligning the budgeting process with the focus areas of the University” (SAd, 2005). The opinion was voiced that “IT is high risk but crucial – for example, it is vital that student records are correct”, and, of course, vital for any distance or eLearning initiative (ExMgm, 2005). The choice of an enterprise software system was strategic according to the VC. It was a large cost to the University, and the changeover caused major disruption. (This point will be discussed further when the ERP system is examined). The issue of disruption was made by several staff members interviewed.

A senior academic stated that IT “was being taken seriously by the University, but being managed in a top-down manner and should be more needs driven”.

One senior staff member stated that there was such a drive in their unit towards a paperless environment that if the system was down, no work could be done. Another stated that IT was vital, but that IT human resource capacity was a problem. This was taken to mean that frustrations existed regarding service levels (SAc).

Using McFarlane and McKenney’s grid (Figure E-4 the position of UFS is perceived as more strategic by, for example, the VC (ExecMgm, 2005). This view may be attributable to the

strategic importance of eLearning for the University, and thus the necessity for IS/ICT support.

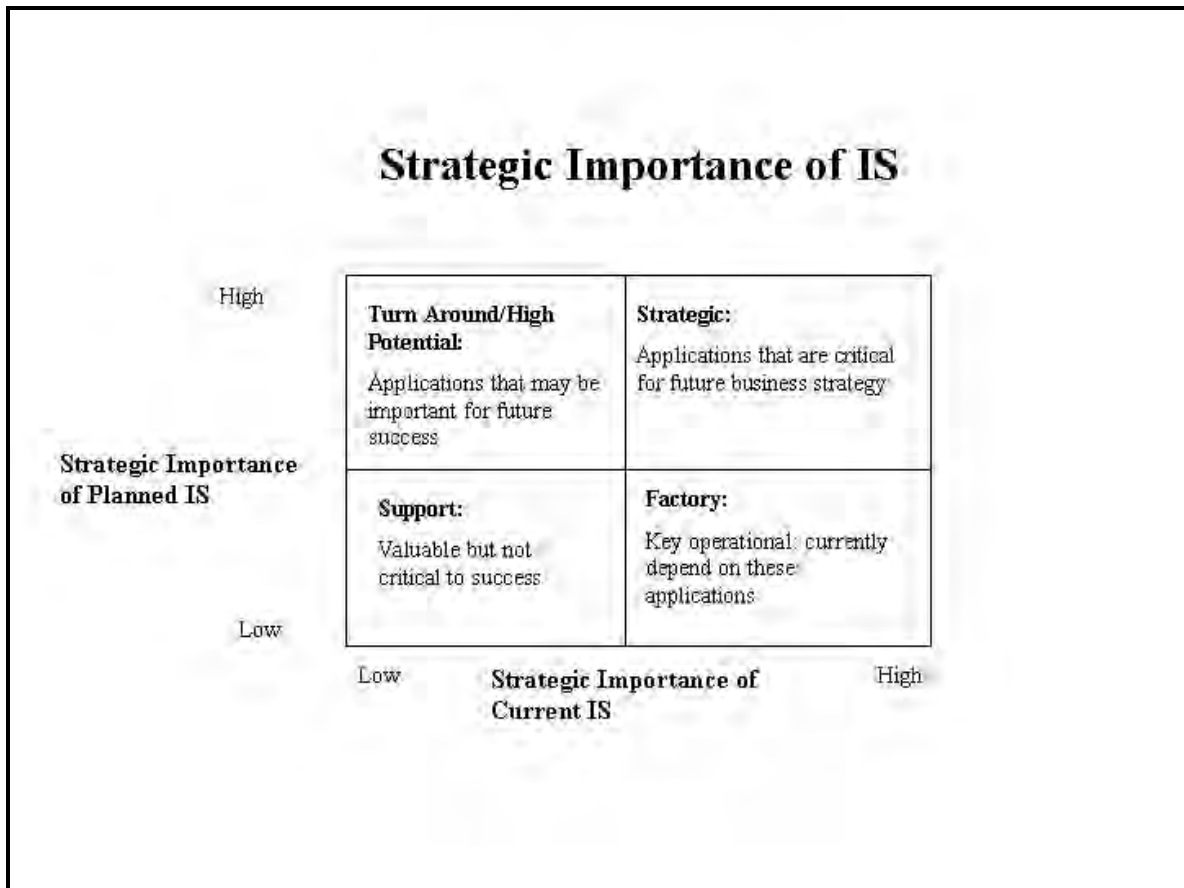


Figure E-4 Strategic importance of IS/ICT - McFarlan and McKenney's Grid (in Ward and Peppard, 2002)

### E.5.2 Background

The IT Division is seen as in a process of change. A new IT Director was appointed at the beginning of 2005 as Head of Technical Support. This post had been vacant for a number of years. This is in support of the existing Director of Computer Systems who has been serving the University in the IT Division for over 20 years, and who was in charge of the cut-over to a new ERP system at the end of 2003.

### **E.5.3 IT provision ratios**

The ratios of staff and students and workstations were not available from the IT Division.

Student residences were wired for connectivity, some faculties have an open laboratory for their students, and “more computers have been installed for student use, which is beneficial for students who do not have computers at home” (Student, 2005).

### **E.5.4 Strategic planning and management (SIPM)**

The IT Directors made the point very forcibly that although no strategic plans were in place for IS/ICT, planning was in progress and should be completed within 6 months. Some of the academics stated that there were no strategic plans and were not aware of any progress in this regard. They were of the opinion that they should in any event be involved in the process: “The IT Strategic plan is not known and input has not been sought” (SAc, 2005). Other senior staff noted that this was not accurate, as the status of the process had been circulated and that staff perhaps were uninformed because of an information overload. This points to a communication problem.

### **E.5.5 Knowledge and Communications Management**

There was no suggestion that these two aspects of strategic planning would be incorporated in the planning process.

## ***E.6 IS/ICT involvement and support at the strategic level***

IT supports the processes of the University and, as stated, particularly the strategic thrust of e-learning, but it (IT) has been neglected (ExMgm, 2005) – “it is just there and should be energised – we are getting there”. And “IT could lead innovation” (ExMgm, 2005). A senior administrator stated that IT was not strategically driven, but focused on day-to-day operations (SAd, 2005).

## ***E.7 Alignment Maturity***

Regardless of how much formal planning has occurred, the question remained of how much *de facto* alignment existed between the organisational objectives and the support given by IT.

The IT management feel alignment with the strategic goals of the University was being achieved particularly by virtue of the IT Director now sitting on the Executive Management Committee (and did not do so before).

The maturity questionnaire was used to prompt responses on this. An averaged analysis table is shown (Table E-2) while the full results are shown in Table E-3. This could be instructive when the formal planning process takes place.

Respondents: 5 Senior Academics and 2 Senior Administrators (collectively identified as “Users”).

Rating scale: 1 to 5 where 1 = “Lowest level of maturity” and 5 = “Highest level of maturity”.

<b>Q1.2 Alignment Maturity Index</b>			
<b>Category</b>	<b>Users</b>	<b>IT</b>	<b>All</b>
Communications	2.0	2.8	2.2
Competence/Value metrics	1.7	1.3	1.6
Governance	2.9	2.3	2.8
Partnership	2.4	2.8	2.5
Scope and Architecture	1.8	3.0	2.1
Skills	2.3	2.0	2.2
Overall Average	2.3	2.6	2.4

**Table E-2 Alignment Maturity by category**

Management and IT are quite similar on this index summarised by category. The overall index is 2.4.

The full table indicates areas of disagreement between the two categories of respondents (bold-typed). The areas of interest are where the opinions of IT management and senior management diverge by a rating of 1 or more (chosen arbitrarily by the author).

<b>Q1.2 Alignment Maturity</b>						
<b>Category and issues</b>		<b>Ac</b>	<b>Ad</b>	<b>Users</b>	<b>IT</b>	<b>All</b>
<b>1 Communications</b>						
1.1	<b>Understanding of business by IT</b>	2.0	3.0	<b>2.5</b>	<b>5.0</b>	3.1
1.2	Understanding of IT by business	2.0	3.0	2.5	3.0	2.6
1.3	Inter/intra-organisational learning	1.5	1.0	1.3	1.0	1.2
1.4	<b>Style and ease of access</b>	1.0	4.0	<b>2.5</b>	<b>4.0</b>	2.9
1.5	Knowledge sharing/leveraging intellectual assets	1.0	1.0	1.0	1.0	1.0
1.6	IT staff/business liaison	2.0	3.0	2.5	3.0	2.6
Average		1.6	2.5	2.0	2.8	2.2
<b>2. Competence/Value metrics</b>						
2.1	IT metrics	2.0	2.0	2.0	2.0	2.0
2.2	Business metrics	1.0	1.0	1.0	1.0	1.0
2.3	Link between IT and business metrics	1.0	1.0	1.0	1.0	1.0
2.4	Service level agreements of IT function	1.0	1.0	1.0	1.0	1.0
2.5	<b>Benchmarking</b>	3.0	2.0	<b>2.5</b>	<b>1.0</b>	2.1
2.6	<b>Formal assessment / reviews of IT investments</b>	2.0	2.0	<b>2.0</b>	<b>1.0</b>	1.8
2.7	Continuous improvement practices	3.0	2.0	2.5	2.0	2.4
Average		1.9	1.6	1.7	1.3	1.6
<b>3. Governance</b>						
3.1	Formal business strategic planning	3.0	3.0	3.0	3.0	3.0
3.2	<b>IT strategic planning</b>	4.0	3.0	<b>3.5</b>	<b>1.0</b>	2.9
3.3	<b>Organisational structure</b>	1.0	3.0	<b>2.0</b>	<b>1.0</b>	1.8
3.3	<b>Reporting relationships</b>	5.0	3.0	<b>4.0</b>	<b>3.0</b>	3.8
3.4	Budgetary control	2.0	2.0	2.0	2.0	2.0
3.5	Rationale for IT spending	4.0	3.0	3.5	4.0	3.6
3.6	<b>Steering committee</b>	3.0	2.0	<b>2.5</b>	<b>1.0</b>	2.1



Category and issues		Ac	Ad	Users	IT	All
<b>3. Governance ctd</b>						
3.7	Prioritisation process	2.0	4.0	3.0	3.0	3.0
Average		3.0	2.9	2.9	2.3	2.8
<b>4. Partnership</b>						
4.1	<b>Business perception of IT value</b>	2.0	3.0	<b>2.5</b>	<b>1.0</b>	2.1
4.2	Role of IT in strategic business planning	1.0	2.0	1.5	2.0	1.6
4.3	<b>Shared goals, risk, rewards/penalties</b>	1.0	n/a	<b>1.0</b>	<b>3.0</b>	1.7
4.4	<b>Managing the IT-business relationship</b>	3.0	5.0	<b>4.0</b>	<b>2.0</b>	3.5
4.5	<b>Relationship / trust style</b>	2.0	4.0	<b>3.0</b>	<b>5.0</b>	3.5
4.6	<b>Business sponsor/champion</b>		1.0	<b>1.0</b>	<b>4.0</b>	2.0
Average		1.8	3.0	2.4	2.8	2.5
<b>5. Scope and Architecture</b>						
5.1	Primary systems	1.0		1.0	1.0	1.0
5.2	<b>Standards articulation</b>	2.0	1.0	<b>1.5</b>	<b>3.0</b>	1.9
5.3	<b>Architectural integration: Systems across the</b>	1.0	3.0	<b>2.0</b>	<b>3.0</b>	2.3
5.4	<b>Architectural integration: Architectural</b>	2.0	2.0	<b>2.0</b>	<b>5.0</b>	2.8
Average		1.5	2.0	<b>1.8</b>	<b>3.0</b>	2.1
<b>6. Skills</b>						
6.1	<b>Innovation, entrepreneurship</b>	2.0	3.0	<b>2.5</b>	<b>4.0</b>	2.9
6.2	<b>Key IT HR decisions made by</b>	1.0	3.0	<b>2.0</b>	<b>1.0</b>	1.8
6.3	<b>Change readiness</b>	1.5	3.0	<b>2.3</b>	<b>1.0</b>	1.9
6.4	<b>Career crossover</b>	4.0	1.0	<b>2.5</b>	<b>1.0</b>	2.1
6.5	Education, cross-training	2.0	2.0	2.0	2.0	2.0
6.6	Social, political, trusting environment	2.0	3.0	2.5	3.0	2.6
6.7	Attract and retain top talent	1.5		1.5	2.0	1.7
Average		2.0	2.5	2.3	2.0	2.2
Overall Average		2.0	2.6	2.3	2.6	2.4

**Table E-3 Maturity index in detail**

The same caution as for the other case studies holds here – a small sample of opinions is represented. An average index of 2.4 is calculated using the three average scores where 5 represents fully mature alignment. However, this survey elicited academic responses (unlike the previous two cases), and thus two sets of user responses are shown, academic, and administration. This is instructive as, in general, the administration and IT have similar indices, while academics differ more markedly. The items indicating a greater than or equal to a 1 point difference between users and IT are bold-typed in Table E-3. Academics have a higher estimation of governance issues than does IT, while the reverse perception holds for Communications and Business partnerships. This points to a communication/understanding gap. However, the new IT Director is very aware of the need to build the communication channels.

## ***E.8 Implementation and monitoring***

Implementation and monitoring are part of SIPM. There are no formal management techniques, such as the Balanced Scorecard System, to monitor the performance of the IT Division in place as yet, although a system is being established. From interviews, perceptions of service with respect to information provision were collected.

## ***E.9 Support for tactical, management needs***

### **E.9.1 IT support for management decision-making**

One of the issues being examined is whether IT can help to improve the efficiency of decision-making at tertiary institutions given the management culture (Dobson and McNay, 1996) and the level of committee decision-making.

With respect to committee meetings, the Registrar (General) in charge of overseeing the “governing bodies of the University, and meetings from council level to faculty boards” (SAd, 2005) has been pointed out as being proactive in using IT. A system has been purchased for agenda and minute management and ensures a virtually paper-free meeting. Agenda items and related documentation are captured, and the electronic agenda has

hyperlinks to the relevant documentation. The Registrar has monitoring rights to ensure that submissions are in the correct format. Wireless connected meeting rooms exist for top management meetings, and members of the committees attend these meetings with laptops and are able to access the documentation on-line. Minutes are crafted while the meeting is in progress, and these are visible to all. Final minutes can be sent out 30 minutes after the close of the meeting. These minutes are electronically searchable.

The UFS is possibly the only University world-wide using this system (according to the suppliers of the software). Not only does this get the information stored, and searchable for later reference, but it also allows the minutes to be approved faster and therefore, actions to be taken more timeously. It also prevents chairs of meetings “interpreting” the minutes, so greater accuracy and validity is ensured. One Dean mentioned that it also allowed members of meetings to send emails regarding actions to staff members and committee members to conduct other work if the matters were not pertinent to the person were being discussed (this could easily happen in a large diverse faculty). This did require careful chairing to make sure that members concerned were not too busy with other work. This system provided a huge improvement on sending minutes and documentation by email as this clogged up the system and of course, the paperless element was also a bonus.

The wireless meeting rooms are critical to this effort, and some deans felt that their requests for such facilities for faculties were being ignored. The software described above is only being used for executive management meetings and not at faculty level.

### **E.9.2 Academic management**

Most academic managers interviewed expressed dismay at the lack of systems and information to support academic decision-making. An example was mentioned of the need for information regarding academic staff research output when considering requests for leave or promotion. This is not available. Budgetary information is not available on-line but can be downloaded from the main system, through intermediation. The planning unit is able to provide information to aid academic decision-making, but this is once again a lengthy step.

### **E.10 Support for core operations: Teaching and research**

E-Learning is a major focus of the University. The University prides itself on being “one of the first to be pro-active in the area of electronic learning” (ExMgm, 2005). WebCT<sup>®</sup> is the software being used. An academic mentioned that the support for eLearning was very good. Generally student opinions were reasonably positive, and students seemed appreciative of the eLearning environment.

The diagram representing the core operation loop is reproduced (Figure E-5 from Figure 6-9):

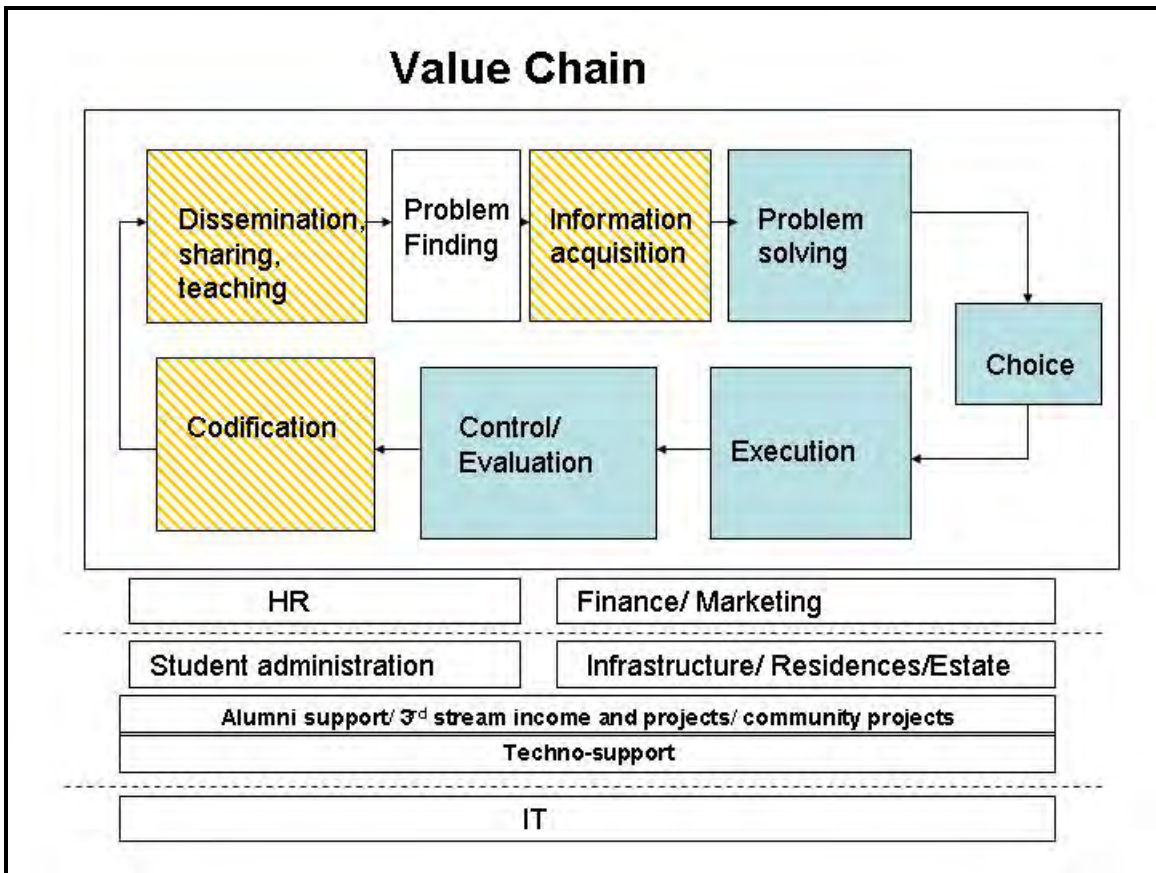


Figure E-5 Core value chain processes

### ***E.10.1.1 Information acquisition***

A student stated that IT does not really support student needs as restrictions on web sites do not allow for proper research (for sites that could be seen as risqué for example), and the slowness of the Internet and viruses were mentioned as problematic (Student, 2005).

### ***E.10.1.2 Codification***

WebCT<sup>®</sup> is used for some codification of teaching material.

### ***E.10.1.3 Dissemination***

Although presentation facilities are available in most venues (after some faculties reportedly had to battle to get these installed) to support teaching, buildings are somewhat outdated (old and not well planned initially), and teaching equipment (data projectors) are liable to disappear (SAc, 2005). This problem is mentioned in the VC's address on areas that need further improvement although a great deal of money had been spent in upgrading facilities (UFS website). Lack of support for lecturers after hours, when classes are being held was mentioned.

Email is used between campuses to facilitate content sharing. This is apparently working well. Videoconferencing was tried for sharing lecturing, but the line was too bad for this to be effective.<sup>15</sup>

Software to support research (and presumably its dissemination) has been purchased, but at the time of interviewing, was not operative. A list of research activities exists on the web.

### ***E.10.1.4 Control/evaluation***

No technological support for evaluation of learning was in existence at the time of interviewing.

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<sup>15</sup> The line speed has improved, but this does not appear to have been communicated to academics

## ***E.11 Support for support functions***

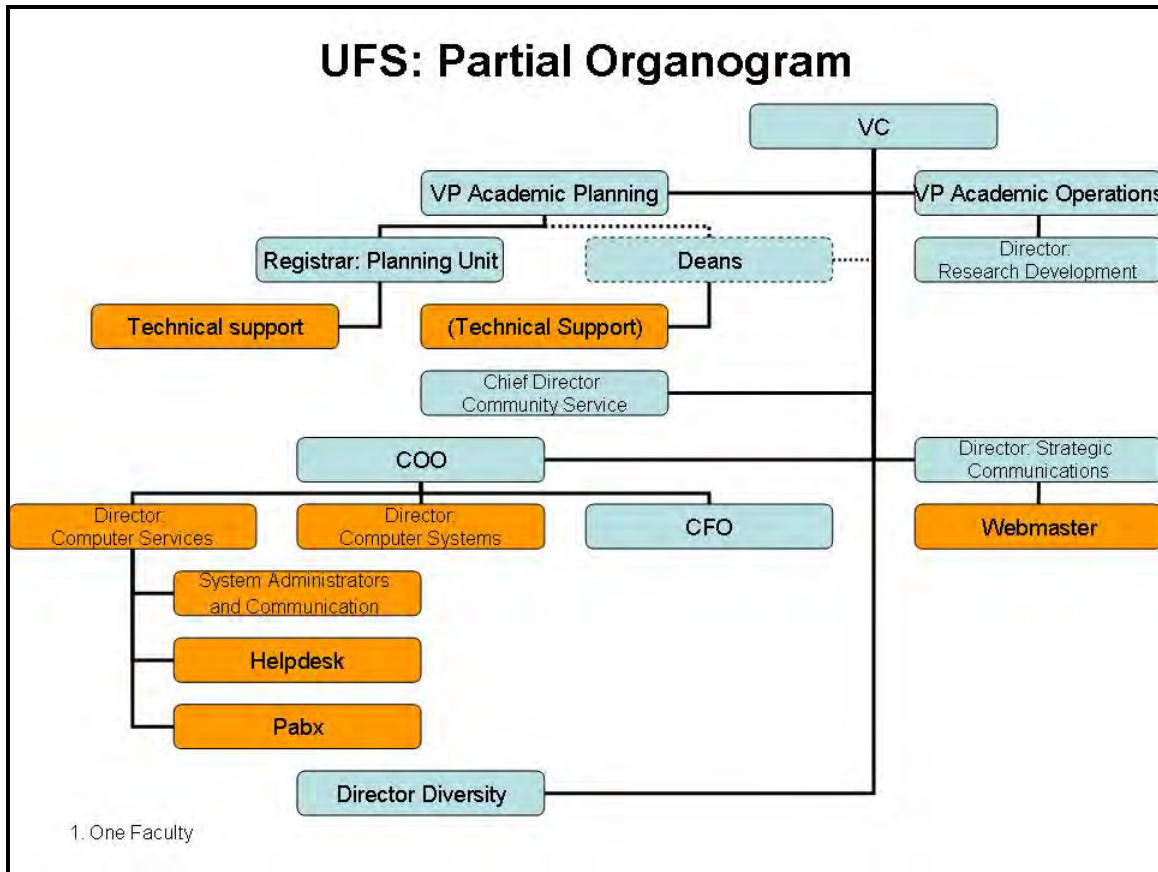
The senior administrators in the support functions expressed satisfaction with the level of support they were receiving. They had committed a great deal of time and energy when the new ERP system was installed, and were happy with the information they were provided with.

## ***E.12 Quality of IT management***

### **E.12.1 Structure and management**

#### ***E.12.1.1 Structure***

UFS employs two IT Directors, one in charge of software and systems and the other in charge of technical support (a relatively new appointment). The directors report to the Chief Director of Operations (as do the Director of Finance, Director of Budgets and Director of Human Resources), who in turn reports to the VC. Thus IT is positioned as equally important as the other support services but not more so. Figure E-6 indicates the parts of the organogram that are IT related.



**Figure E-6 UFS: Partial IT related organogram**

The webmaster reports to the IT Support Services Director, “via his line manager, in computer services, on all operational issues, however layout and functionality of the webpage itself gets managed by strategic communication. Strategic communication can ... be seen as a customer of IT Services. The web system is developed to provide them (Strategic Comm.) with interfaces to do the web content: IT provides the tools, they provide the content” (ITMgm, 2005).

As for the previous case studies, this reporting structure is not the “ideal” reporting structure of all IS/ICT functions grouped together reporting at the highest level. However, the fact that the two IT Directors of services and computer systems reported to one person is a more positive step.

However, the Registrar of Strategic Planning is responsible for institutional data and is divorced from the IT Division. This has its benefits, but also problems, as will be discussed later (under “Organisational information needs”).

### ***E.12.1.2 Staffing***

Despite the generally reported difficulty in attracting and retaining IT staff in SA HEIs, as reported in Chapter five, this is not a problem at UFS according to IT Management (ITMgm, 2005). The UFS website indicates that there are 44 staff members in the section. They employ temporary staff (presumably students) during the peak hours of 8 to 12. Staff turnover is low to the extent that it makes it difficult to meet equity targets by hiring new staff, and the number of staff in software and systems is said to be adequate where there are eight staff members to support the enterprise system and 8-12 student assistants (ITMgm, 2005). This appears to contradict opinions voiced elsewhere that needs are not being met sufficiently because of lack of resources, especially human resources.

“Super-users” exist in support units and some faculties, and they provide liaison with the IT Division and the relationships are good. One senior manager notes that they have identified (serendipitously) a person in IT who they find responsive and “use” that person for their requests.

The IT Management is proud of the “visionary capabilities of the staff, who are innovative and have the ability to think out of the box” especially with regard to their network capabilities (ITMgm, 2005).

### ***E.12.1.3 Budget***

The IT budget as a percentage of the full budget was not available. The staffing budget consumed 80% of the annual IT budget, while the remaining approximately 20% was broken down into information sources, 5%; replacement of expensive equipment, 1%; research, 4%; capital expenses, 4%, maintenance of capital assets, 3.3%; reserves, 2%; and replacement of lab workstations was 1% (SAd, 2005).



## **E.12.2 Management and governance**

### ***E.12.2.1 Service level agreements***

No Service Level Agreements (SLAs) are in place yet, but the process is in place to establish SLAs (SAc, 2005). This status is mirrored by the ranking of this item in the maturity questionnaire at level 1 (see Table E-3 Item 2.4).

### ***E.12.2.2 Committees and meetings***

An advisory committee exists comprising executive management members, faculty representation and student representation. This is not a steering committee, but advises on matters that are campus-wide: it has less executive power than a steering committee.

Reportedly all faculties, and certainly the two interviewed, have IT Faculty committees on which HoDs and students serve. These are also attended by the IT Directors. They do not report to the Advisory Committee. One senior academic noted that this should be formalised (SAc, 2005), but that matters were still in a state of change.

### ***E.12.2.3 Policies***

An acceptable usage policy exists and a web policy is being put into place. Other policies may exist (this was not clear from the interviews), but have not been made available electronically. The point was again made that the IT unit is in a process of change, and that these are matters that are being given attention. An example was made that a policy was required on “hot spots” for wireless networks, as they posed security problems.

### ***E.12.2.4 Charge-out policy***

No charge-out policy is applied to departments. Students do not pay a levy for computer or network usage, although there is a usage fee for Internet usage, dependent on volume of traffic.

### ***E.12.2.5 Security and disaster recovery***

Echoing an international concern, security was mentioned. This could be one of the reasons for not wishing to install web-cam type pc-to-pc videoconferencing, as requested by academics to increase management span. Hardware technology is in place to “scrub” incoming mail, but they envisage acquiring new hardware to handle security better. No information was forthcoming in respect of disaster recovery (the question was not asked at the interview, and it was difficult to get answers to follow-up questions).

## ***E.13 Quality of IT service***

### **E.13.1 Service quality**

The quality of the service provided by the IT Division was examined. Mixed opinions were voiced. Comments by academics were that Faculties were not seen as clients and should be, but that communications were improving. A senior administrator said that the level of support depended on specific needs, but that staffing capacity was a problem although this had eased slightly with two new appointments. The same administrator stated that “computer service staff are very knowledgeable, and if there is a problem they work on it and provide a solution within a few hours and are willing to learn” (SAd).

Some complaints were that the University runs courses after hours and there are no service staff to support lecturers at this time and that the server up-time could be improved (this was mentioned more by students as a concern, although one academic staff member also mentioned this as a slight concern). As mentioned above one student expressly stated that IT services were always good (Student, 2005).

So there are brickbats and bouquets, as would be expected from a service unit.

The Servqual questionnaire (Q2.4) was used to corroborate the opinions and give a profile of the institution’s IT service culture. The questionnaire proved to provide some difficulties in completion as respondents were unsure whether to rate the service of IT support people in the Faculties, the Planning Unit, or the Central IT Division. The latter was the intention of the

questionnaire and this was communicated to the respondents. The instrument is constructed to allow for respondents to reply to “Ideal”, “Possible” and “Actual”. Table E-4 categorises responses by types of users for “Actual” service.

Respondents: 4 Senior Academics, 3 Administrative Staff (including library) and 7 students.

Rating Scale: 1 to 7 where 1 = “Poor” and 7 = “Excellent”.

<b>Q2.4 Servqual</b>					
<b>Actual Service</b>	<b>User category</b>				
	<b>IT</b>	<b>Academi</b>	<b>Admi</b>	<b>Studen</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	6.0	3.0	5.5	4.7	4.4
Perform the service right the first time	6.0	3.8	6.5	4.7	5.0
Inform users when request can be completed	7.0	2.8	7.0	3.7	4.5
Inform users regularly about the status of users' requests	7.0	2.0	7.0	3.3	4.1
Provide services at the time they promise to do so	6.0	3.5	7.0	4.3	4.9
Average	6.4	3.0	6.6	4.1	4.6
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	7.0	4.3	6.5	5.9	5.5
Give prompt service to users	7.0	3.5	6.0	4.3	4.6
Always be willing to help users	7.0	4.5	7.0	4.5	5.3
Never be too busy to respond the users' requests	7.0	3.8	6.0	4.6	4.8
Average	7.0	4.0	6.4	4.8	5.1
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	7.0	3.8	7.0	4.3	5.0
Be consistently courteous with users	6.0	3.5	7.0	5.0	5.2
Have the knowledge to answer users' questions	7.0	3.3	7.0	5.9	5.4
Average	6.7	3.5	7.0	5.0	5.2
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	7.0	3.8	7.0	4.6	5.1

<b>Actual Service</b>	<b>User</b>				
	<b>IT</b>	<b>Academi</b>	<b>Admi</b>	<b>Studen</b>	<b>User</b>
<b>Empathy ctd</b>					
Have employees who give you personal attention	7.0	4.3	7.0	4.4	5.2
Have the users' best interests at heart	7.0	3.0	7.0	4.3	4.8
Understand the specific needs of their users.	7.0	2.8	7.0	4.4	4.7
Average	7.0	3.4	7.0	4.4	5.0
Overall Average	6.9	3.6	6.8	4.8	5.1

**Table E-4 Servqual – Actual**

The service is seen as good – nearly perfect - by IT, and also by Administration, less so by students, and just average by Academics.

The picture is possibly skewed by the fact that top administrators were targeted, who would have the power to demand good service, while the same may not be the case at lower levels. Similarly the needs of top academics (who were targeted) might be more stringent than at lower levels, and at this lower level the perception may well be higher. An offer was made to spread the survey wider as a rigorous quantitative study, but was not taken up.

The “possible” perceptions are shown next. This indicates what users and IT see as possible service given limitations of technology and staff (numbers and skills).

<b>Q2.4 Servqual</b>					
<b>Possible Service</b>	<b>User category</b>				
	<b>IT</b>	<b>Academic</b>	<b>Admin</b>	<b>Student</b>	<b>User</b>
<b>Reliability: Excellent information services will</b>					
When promising to do something by a certain time, will do so	6.0	5.9	5.0	5.5	5.5
Perform the service right the first time	5.0	5.7	6.5	6.5	6.2
Inform users when request can be completed	7.0	5.9	6.0	7.0	6.3
Inform users regularly about the status of users' requests	7.0	6.0	6.3	7.0	6.4

Possible Service	User				
	IT	Academic	Admin	Student	User
<b>Reliability ctd</b>					
Provide services at the time they promise to do so	6.0	6.3	4.8	7.0	6.0
Average	6.2	5.9	5.7	6.6	6.1
<b>Responsiveness: Excellent information services will</b>					
Have operation hours convenient to all their users	7.0	6.3	6.0	6.5	6.3
Give prompt service to users	7.0	5.9	6.7	6.0	6.2
Always be willing to help users	7.0	5.8	6.7	7.0	6.5
Never be too busy to respond the users' requests	7.0	5.9	6.7	6.0	6.2
Average	7.0	6.0	6.5	6.4	6.3
<b>Assurance: Employees in excellent information services will</b>					
Instil confidence in users by their behaviour	7.0	6.1	7.0	7.0	6.7
Be consistently courteous with users	6.0	6.4	6.7	7.0	6.7
Have the knowledge to answer users' questions	7.0	6.6	6.0	7.0	6.5
Average	6.7	6.4	6.6	7.0	6.6
<b>Empathy: Excellent information systems employees will</b>					
Give users individual attention	7.0	6.0	7.0	7.0	6.7
Have employees who give you personal attention	7.0	5.9	6.7	7.0	6.5
Have the users' best interests at heart	7.0	6.3	7.0	7.0	6.8
Understand the specific needs of their users.	7.0	5.7	7.0	7.0	6.6
Average	7.0	6.0	6.9	7.0	6.6
Overall average	6.9	6.1	6.7	6.8	6.5

**Table E-5 ServQual - Possible Service**

Again, expectations are high. IT rates possibilities for offering good service higher than do users.

The interesting area is the difference between Actual and Possible and the gap between IT and User perceptions as shown in Table E-6.

<b>Q2.4 Servqual</b>		
<b>Gap: Possible-Actual Service</b>	<b>Category of user</b>	
	<b>User</b>	<b>IT</b>
<b>Reliability: Excellent information services will</b>		
When promising to do something by a certain time, will do so	1.1	0.0
Perform the service right the first time	1.3	-1.0*
Inform users when request can be completed	1.8	0.0
Inform users regularly about the status of users' requests	2.4	0.0
Provide services at the time they promise to do so	1.2	0.0
<b>Average</b>	<b>1.6</b>	<b>-0.2</b>
<b>Responsiveness: Excellent information services will</b>		
Have operation hours convenient to all their users	0.8	0.0
Give prompt service to users	1.7	0.0
Always be willing to help users	1.2	0.0
Never be too busy to respond the users' requests	1.5	0.0
<b>Average</b>	<b>1.3</b>	<b>0.0</b>
<b>Assurance: Employees in excellent information services will</b>		
Instil confidence in users by their behaviour	1.8	0.0
Be consistently courteous with users	1.6	0.0
Have the knowledge to answer users' questions	1.2	0.0
<b>Average</b>	<b>1.5</b>	<b>0.0</b>
<b>Empathy: Excellent information systems employees will</b>		
Give users individual attention	1.6	0.0
Have employees who give you personal attention	1.4	0.0
Have the users' best interests at heart	2.1	0.0

Gap: Possible-Actual Service	Category of user	
	User	IT
<b>Empathy ctd</b>		
Understand the specific needs of their users.	<b>1.9</b>	<b>0.0</b>
Average	<b>1.8</b>	<b>0.0</b>
Overall Average	<b>1.5</b>	<b>0.0</b>

**Table E-6 Gap: Possible-Actual by category**

The IT Division feels that it is performing (and sometimes over-achieving) according to what is possible (a 0.0 overall rating). Users do not agree. Items that differ between IT and user perceptions by >1 point have been bold-typed (the \* indicates “over-performance”). These are clear indications of perception mismatches and these seem mainly concerned with user involvement and communications. All but one item has at least a 1 point difference.

### **E.13.2 Helpdesk**

A helpdesk has been instituted and over a specific 8 week period, it was monitored that 1600 calls were serviced. 84% of problems are resolved by this individual on first remote call (ITMgm, 2005). Problems are tracked for staff queries. Student queries are sorted out by tutors (or “demis” as they are called) in laboratories. Hardware requests have a 24 hour turnaround rate, but it is not easy to estimate this on software requests. This is a new venture and seems to be welcomed as an improvement.

### ***E.14 Robustness of services and architecture***

The systems are up 24 hours a day. Staff work from 8 to 5 (with the additional staffing during peak times). If there are special after hours needs for support, this can be managed by making special arrangements.

## ***E.15 Systems Portfolio***

### **E.15.1 System to support information needs**

#### ***E.15.1.1 Microsoft and open source***

No specific mention was made of open source software. Microsoft office is deployed throughout the University.

#### ***E.15.1.2 ERP systems: New system installation***

A change was made from custom built software to an ERP system (PeopleSoft<sup>®</sup>) at the end of 2004. One of the reasons for the move was that too much dependence was placed on individuals with knowledge of the systems, and this placed the University at risk by this reliance (ExMgm, 2005). It was felt that an internationally developed and supported system would have better stability and support. The installation was a “cut-over” installation. Staff members noted that at another University, modules were being installed one at a time and being adapted or adapted to more slowly. They felt that this was a wiser option, and that the cut-over option was “dangerous”. The change-over caused a huge amount of work and stress. This was especially mentioned by many of the top administrators: “the workload trebled” (ExMgm, 2005) and it was a “traumatic” time. However, most individuals interviewed felt that the change-over was a success. One senior manager stated a continuous process of adaptation to the system would happen.

#### ***E.15.1.3 ERP systems: Process changes***

PeopleSoft<sup>®</sup> is a system customised for the North American tertiary education market. “Best practice” processes built into the software are different to the processes actually in place at UFS, and some customisation was required. For example, dual-language university needs were not catered for. As little customisation as possible was done because of the attendant problems with upgrading of the software, although the software has the built-in ability to detect and highlight areas customised on upgrading. External consultants were used for



customisation, but now “skills exist in-house to do implementation” (ITMgm, 2005). The customisation that was enforced was to support compliance with national laws and regulations.

A critical comment was that the system did not streamline processes – more steps were required to complete a simple transaction. This was ascribed to the fact that the IT division was still too busy implementing the system, and could not yet put resources into fine tuning the programmes. Another point made was that PeopleSoft<sup>®</sup> was built for a manufacturing environment and that some processes were not catered for. A specific example mentioned was that of sundry debtors and cashiering. Some unhappiness exists with the new system specifically in that processes have to be adapted to fit the system. Some staff stated that not enough investigation had gone into examining the processes of the University and the fit of the software to these before purchase. Lack of human resources was blamed for this.

#### ***E.15.1.4 ERP systems: Resistance to change***

Resistance to the new system is not unexpected, as stated by IT management: “No-one likes adapting if they have had a customised system before”. Resistance to change is a well known problem. The previous system(s) were reportedly not particularly user friendly, but this system does not appear to be better in this respect especially given the level of present expertise of users, although one “power user” in a support unit stated that “at first the system was not user-friendly but that users are getting used to it” (Ac, 2005). Users initially found the system difficult to use, but one administrator reported that they were adapting to it.

#### ***E.15.1.5 ERP systems: Process reengineering***

A more positive opinion was that the new software allowed the University to “modernise”, to look at best practice processes and to change some of the processes. One senior administrator noted that they had seconded two people for the year from their unit to help tailor the system and put in the controls they required and were very happy with the results (SAd, 2005).

A challenge facing the University is whether to move to a newer version of the software. This decision on when to move to a new version with, usually, more functionality or better support is a typical problem faced by packaged software users and managers.

***E.15.1.6 ERP usage***

With respect to information provision of the ERP system, firstly there appear to be few direct users (at the time of writing). Because of the paucity of direct users, requests for information go to support units, who then approach either the Planning Unit or the IT Division to provide them with reports. The Planning Unit also has to request reports from the IT Unit.

The effectiveness of the enterprise system was assessed and given the following rating Table E-7):

Respondents: 1 IT Director, 5 senior academics and 3 senior administrators.

Rating scale: 1 to 5 where 1= poor and 5 = excellent.

<b>Q2.3 Enterprise System</b>			
<b>Issues</b>	<b>User category</b>		
	<b>Academic</b>	<b>Admin</b>	<b>IT</b>
<b>Does the system provide you with the precise information you need?</b>	<b>2.8</b>	<b>4.0</b>	<b>4.0</b>
Does the information content meet your need?	2.2	4.0	4.0
<b>Does the system provide reports that seem to be just about exactly what you need?</b>	<b>1.8</b>	<b>4.0</b>	3.0
<b>Does the system provide sufficient information?</b>	<b>2.0</b>	<b>4.0</b>	3.0
<b>Is the system accurate?</b>	<b>3.0</b>	<b>5.0</b>	5.0
<b>Are you satisfied with accuracy of the system?</b>	<b>3.0</b>	<b>4.5</b>	<b>5.0</b>
Do you think the output is presented in a useful manner?	2.2	3.5	4.0
<b>Is the system user friendly?</b>	<b>2.0</b>	<b>4.0</b>	<b>5.0</b>
<b>Is the system easy to use?</b>	<b>2.0</b>	3.5	<b>5.0</b>
<b>Do you get the information you need on time?</b>	<b>2.4</b>	4.5	<b>5.0</b>
<b>Does the system provide up-to-date information?</b>	<b>3.0</b>	4.5	<b>5.0</b>
Is the system robust?	2.6	3.0	4.0
Are the services always available?	3.2	4.5	4.0
<b>Can you tailor the output to your needs?</b>	<b>2.0</b>	<b>4.0</b>	<b>5.0</b>
<b>Is it easy to get the exact information you need?</b>	<b>2.0</b>	<b>4.0</b>	<b>5.0</b>
Average	2.4	4.1	4.4

**Table E-7 Enterprise system supporting information needs**

Table E-7 echoes views expressed where academia is less happy with the provision of information, and administration and IT are on the whole happy with what is provided. Items differing by 2 points or more have been bold-typed. These apply to academics versus IT, indicating areas of unhappiness or miscommunication.

### ***E.15.1.7 Other systems***

Other systems have been purchased to fill the “gaps” in the enterprise system. For example, a timetabling and exam scheduling system, a research management system and a meeting and reporting system. The latter is successful (and will be discussed again later in Section E.18.4 as innovative applications), but the former two are still in process of installation or problematic.

The IT Division is happy for units and departments to install their own software and databases, advice will be given on purchases, and they are happy to provide downloads from the enterprise system for input to these systems. However, the enterprise system is the one “version of the truth”, and it is up to the users of the other databases to keep their systems synchronised. A list of supported software does exist, but it is not clear whether that is available generally.

### **E.15.2 Portfolio completeness**

The list of systems commonly found in universities was listed and IT management asked for comment. Some clarity is still required on whether the applications are catered for in the ERP system or elsewhere, but this is not forthcoming at present.

The profile of the University is shown below as percentages of categories (nothing was listed under the “planned for” category).

<b>Q2.1 Portfolio Comprehensiveness (Percentage)</b>		
<b>Category of systems</b>	<b>Yes</b>	<b>No</b>
Administration needs	100.0	0.0
Generic student services	73.6	26.6
Administration and academic services for students	33.3	66.6
Academic needs	83.3	16.6
Library services	100.0	0.0
IT Management systems & web features and applications	100.0	0.0

**Table E-8 Portfolio of systems: Percentage completeness of provision**

The administrative needs are clearly being met according to this checklist, and the operational teaching area is also satisfactory – given the focus on eLearning. Student academic and administrative services are less satisfactory. Although portals are ticked as existing for student services, this was not supported by interviews with students. It was stated by other respondents that both PeopleSoft<sup>®</sup> and WebCT<sup>®</sup> have portal software, but that these are not being used (Ac, 2005).

## ***E.16 Quality of information***

### **E.16.1 Government**

The HEMIS requirements are being met, but the incorporation of new campuses has caused some “dirty data”, where the two systems are different and incorrect data has been taken on. A statement was made that some of the data captured was inaccurate, but the Planning Unit are using an add-on for HEMIS which analyses the data and highlights inconsistencies. However, since the data does not “belong” to the Planning Unit, it is then up to the support units to correct this data (SAd, 2005), and this could be a problem area.

### **E.16.2 Executive management**

The VC noted that he did not have any problems with obtaining information – all information is filtered before it reaches him and he has a planning unit that provides him with the information he needs (VC, 2005). He is not a “direct user”.

The Planning Unit was formed to “handle strategic planning; academic planning, program development and evaluation, institutional research and management information, quality assurance and regional cooperation (including incorporation)” (SAd, 2005). It thus provides information specifically to the VP of Planning and to handle the government’s HEMIS (Higher Education Management Information Systems) requirements. The unit also handles requests from other support units, are inundated with requests, and battle to cope with the volume despite having a dedicated and eager team. Some commonly requested reports which had been available on the old system were not (yet) available on the new system, and

the Planning Unit have to repeat the process of collating information on common requests and having standard reports set up. They maintained that they could provide MIS type reports on request provided the purpose was clearly stated, but agreed that it took time with the number of demands made on their resources (Planning Unit, 2005). The unit “to a large extent provides academic leaders/managers with *ad hoc* management information” (SAd, 2005)

The Planning Unit is responsible for planning, but the question was raised by a senior administrator as to who was responsible for monitoring implementation. As there is at present no performance management system in place, IT is not being used pro-actively to monitor implementation. The Planning Unit also questioned who was responsible for maintaining the data (and correcting data that was incorrect – who “owned” the data).

### **E.16.3 Academics, administration and tactical management**

#### ***E.16.3.1 Administration***

Senior administrators appear to be very content with the information provision.

Registration was not automated at the start of 2005, data was entered later, but it had proceeded better than with the old system the previous year, and it was hoped to be on-line next year (SAd, 2005). Staff agreed that registration was a “litmus-test” of the efficacy of the operational and support systems.

However, other senior management staff had different opinions: acknowledged as an exaggeration, but indicative of the level of frustration, the comment was made that the “ITS<sup>©</sup> system is adding no value at all”. “All information has to be obtained through an intermediary, often the Planning Unit, and even then it is difficult. Previously with the old system, users were more able to help themselves” (ExMgm, 2005) (but this is of course early days with the new system). One senior administrator acknowledged that management information needs are not being met at present, and that this is not that the functionality does not exist, but that the focus has been on getting the system up and running and management information is not the first priority. “Much of the functionality of the new enterprise system has not yet been explored” (SAd, 2005).

### ***E.16.3.2 Academics***

Academics, especially senior academics, were forceful in stating that their management needs for information were not being adequately met. Huge dissatisfaction was voiced both by academics and some senior management staff on the difficulty of obtaining management type information.

It was pointed out by the senior academics that the role of academic management had changed and that there was a need for management information: student information such as throughput analysis, staff information on leave records, and research output, but strong opinions were expressed that such needs were not being met. The Planning Unit felt that they did indeed provide this service, and this lack was caused more by communication problems. Academics stated that they did not wish to go through intermediaries or search the web to get the information they needed to operate effectively. It should be readily available, if necessary via a portal type interface on the web. For completing the budget, forms were available, but budget information, for example, was stated not to be user-friendly as the codes were complex. When asked how academics requested information from the IT division, it was clarified that the requests went to support units or the Planning Unit who would then request the information from the IT Division. Departmental student information (class marks and examination marks) could be downloaded into possibly spreadsheet format from the enterprise system, and such marks could also be uploaded from fixed format worksheets and text files to the enterprise system – once again, a two-step process, removing the owners of the data from the system using the data.

### **E.16.4 Students**

Students interviewed did not see information provision as problematic. A senior student opined that WebCT<sup>®</sup> support a host of student needs (Student, 2005). Another stated that student societies were not using IT optimally, but this did not appear to be an IT problem, but rather than a lack of “push” from the students. It was stated by IT management that students could access their academic records and their fee status off the intranet. According to students, the on-line chat has been suspended, but it could not be ascertained why this had happened. An alumni newsletter exists.

## ***E.17 Information behaviour: Information and technology “literacy”***

This section explores the levels of “Information Literacy” at UFS as this could determine the need for technology support, as well as influence the level of usage.

### **E.17.1 Literacy levels**

Questionnaires testing computer and information literacy were completed (these questionnaires - Q3- can be found in Appendix E). The question was “What is your estimations <category> literacy in the medium/system requested on a rating scale of 1 to 5” (changed from the previous case’s rating of 1 – 3). Average scores were calculated as percentages of the maximum score of 5, and the results are shown in Table E-9.

Respondents: 2 senior academics, 2 senior administrators and 6 students.

Rating scale: 1 to 5 where 1 = “Very poor”, and 5 = “Excellent”.

<b>Q3.1 Computer Literacy</b>			
<b>Category</b>	<b>Medium/System</b>	<b>Rating</b>	<b>Average%</b>
Admin	Email	3.83	76.7
	Word-processing	3.67	73.3
	Spreadsheet Use	3.50	70.0
	Administration system use	3.72	74.4
	Database queries	2.72	54.4
	Internal Information seeking on the web	3.20	64.0
	External Information seeking on the web	3.13	62.7
	Electronic library usage	2.83	56.7
Academic	<b>Email</b>	<b>4.39</b>	<b>87.8</b>
	<b>Word-processing</b>	<b>4.28</b>	<b>85.6</b>
	Spreadsheet Use	3.94	78.9
	Administration system use	3.06	61.1
	Database queries	3.61	72.2



	Internal Information seeking on the web	3.83	76.7
	<b>External Information seeking on the web</b>	<b>4.00</b>	<b>80.0</b>
	Electronic library usage	3.67	73.3
Students	Email	3.56	71.1
	Word-processing	3.17	63.3
	Spreadsheet Use	2.94	58.9
	Administration system use	2.83	56.7
	Database queries	2.44	48.9
	Internal Information seeking on the web	3.39	67.8
	External Information seeking on the web	3.44	68.8
	Electronic library usage	3.39	67.8

**Table E-9 Computer Literacy**

Items rating above 79% have been bold-typed to highlight the most proficient areas. From this, it can be seen that academics are rated higher than the other two categories in email, word-processing and web usage, which would be more or less expected. However, the fact that students rate lower than the other two categories, especially in email literacy, is somewhat surprising.

### **E.17.2 Media usage**

The same set of respondents was asked to estimate the importance of electronic media in work related communication. The question asked was “What percentage of your (the respondent’s) work related communication with employee categories within the organisations is based on the following media?”. The perceptions of percentage of media usage are shown in Table E-10. (Unlike the previous case, no rating scale was used.)

Respondents: 2 senior academics, 2 senior administrators and 6 students.

<b>Q3.2 Media Usage</b>		
<b>Group</b>	<b>Media</b>	<b>Average %</b>
Admin	Email	35.0
	Telephone	32.0
	Cell phone	4.9
	Fax	0.9
	Written communications	24.3
	Personal contact	8.0
	Meetings/ conferences	2.1
	Web	0.6
Academic	Email	43.0
	Telephone	21.3
	Cell phone	2.8
	Fax	0.6
	Written communications	2.5
	Personal contact	25.2
	Meetings/ conferences	6.3
	Web	3.8
Students	Email	15.3
	Telephone	6.2
	Cell phone	4.1
	Fax	0.1
	Written communications	2.2
	Personal contact	58.7
	Meetings/ conferences	14.3
	Web	3.8

**Table E-10 Media Usage for communication**

Personal contact with students is the best communication channel – while communication with academics is most often conducted via email, telephone and personal contact, and email, telephone and written communications with administration.

**E.17.3 Media effectiveness/responsiveness**

The responsiveness or effectiveness of communication by media category was assessed with the same respondents. The question asked was, “What percentage of response do you get when communicating with the following categories and using the following media?”. The response rates (what percentage of messages left on this type of media is returned or acknowledged) is shown in Table E-11.

Respondents: 2 Senior Academics, 2 Senior Administrators and 6 students.

<b>Q3.3 Media Responsiveness/ Effectiveness</b>		
<b>Category</b>	<b>Medium</b>	<b>Average%</b>
Admin	Email	91.0
	Cell-phone voicemail	39.3
	Written	61.2
Academic	Email	75.5
	Office voicemail	63.5
	Written	55.6
Students	Email	53.2
	Cell phone voicemail	59.5
	Written	32.8

**Table E-11 Media effectiveness as measured by responsiveness**

Email for academics and administration was seen as effective. Students appeared to be less responsive to most media.

### E.17.4 Media efficiency

Promptness of replies in the various media was used as a measure of efficiency of the media usage. When asked how prompt the replies were on a rating of 1 to 5 in the different categories, the following results were obtained and shown as a percentage of the maximum of 5 - Table E-12.

Respondents: 2 Senior Academics, 2 Senior Administrators and 6 students

Rating Scale: 1 to 5 where 1 = "Poor" and 5 = "Excellent".

<b>Q3.4 Media efficiency/promptness</b>			
<b>Group</b>	<b>Media</b>	<b>Rating</b>	<b>Average%</b>
Admin	Email	3.43	68.7
	Cell phone voicemail	1.88	37.6
	Written	2.41	48.1
Academic	Email	3.72	74.3
	Cell phone voicemail	2.03	40.5
	Written	2.79	55.9
Students	Email	2.35	47.0
	Cell phone voicemail	2.60	52.0
	Written	1.94	38.8

**Table E-12 Media efficiency/promptness**

Email is seen to be the most effective communication with staff members, but not so for communication with students. For students, cell phone usage is more efficient.

The low levels of literacy, responsiveness and efficiency of communication of email particularly for students is surprising and counter-intuitive. A comparison with the other cases will be done in the next chapter (Chapter 11), to test whether this is a common perception.

## **E.18 Transformation alignment**

### **E.18.1 Transformation**

The University has approached the issue of transformation seriously. An indication of this is the appointment of a Director of Diversity, who states that transformation started in the 1980s, “from demands of black leadership to admit black students”. Residences were opened to black students for the first time in 1990 (Tabane, 2005). As discussed, the term transformation is defined variously. At UFS, it encompasses the common definition of transformation as compliance with the law, for example, in terms of employment equity, access for students to improve the demographic profile, and a focus on relevant research, but most staff who were queried about UFS’s stance agreed that it meant more than this basic definition.

The VC, taken from his address (UFS website, 2005) on transformation, writes:

“How do I then understand transformation? Simply put, as a process of *continual and persistent becoming*:

*becoming* a truly South African university of excellence, equity and innovation

*becoming* a high quality, equitable, non-racial, non-sexist, multicultural, multilingual university and place of scholarship ... for South Africa and Africa. ...

*We must therefore continue to transform and re-engineer the UFS into a highly pro-active form. We must cultivate an ingrained habit of change, we must build a sustaining foundation for an always self-renewing, robust university”* (UFS website).

Echoing this, during the course of an interview, he stated that transformation at UFS was a “continuous process of becoming a new institution and changing the institutional culture. Changing demography is not enough. Community engagement is very important and community service is not an after thought” (VC, 2005).

When questioned on the meaning of the term “transformation”, most respondents were clear on the national transformation goals, but included their own extensions to the definition,

most of which echoed the VCs vision of a process of constant if controlled change: “Changing demography is not enough, the institutional culture has to change – community engagement is very important and community service is not an afterthought” (VC, 2005), “It means continuous improvement” (SAc), “It means changing the way of learning and teaching” (SAc, 2005), “It implies a change of the campus to one where everyone feels at home – a culture of non-dominance should exist” (SAd, 2005). Some of the other amplifications of the definition have been given that transformation is a state of continuous improvement, and a “transformation” of other issues such as the practice of learning (SAc, 2005). Similarly a senior administrator stated that, “UFS understands transformation to be a process of continual and persistent becoming: A truly South African university of excellence, equity and innovation; high quality, equitable, non-racial, non-sexist, multicultural, multilingual place of scholarship for SA and Africa” (SAd, 2005).

To advance their transformation goal of community service, a chief director of community services has been appointed, reporting to the VC, who also oversees diversity management. In addition, “five task teams were formed. The different task teams will focus on specific issues such as the language policy, institution culture and values, equity, and diversity (of staff and students), students’ affairs, governance and management” (UFS Website). At the beginning of the year, each of the five strategic focus areas was examined to see how transformation would be achieved in that area. The VC’s address as published on the UFS website (February 2005) is very clear on the importance of transformation, and very transparent about the progress that has been made.

In the wider sense of transformation as dramatic change, an academic stated that the University has gone through a major transformation in the last few years. There has been a financial transformation where the University, from being in dire straits financially, has managed a total turnaround by various means. This was done by expanding student numbers, cutting staff and introducing some distance programmes. (An example of a strategy was that, “Some of the support services were outsourced and rationalised with the aim of minimising the running costs at the university” (UFS website).

The student population has changed as already stated from a white Afrikaans student body to a multiracial body; dual-medium instruction was introduced; the change in the IT systems has caused a major transformation in terms of processes; and finally the incorporation of two campuses has further caused a great deal of change (SAc, 2005).

It also experienced transformation with the installation of the new enterprise system where processes had to be changed. Then there was a cultural transformation, with the University changing to a dual medium (English and Afrikaans) medium of delivery, as well as an increase in African students. The fact that most African students attend the English-language classes does present a problem of segregation, which the University is aware of and is planning to deal with (ExMgm, 2005).

The transformation that has taken place thus far (taken from the UFS website, and supported by an interview with a senior academic) is broken down into three phases:

**“Transformation phase 1:** Introduction of parallel-medium teaching, large changes in student demography, the initial appointment of senior black managers.

**Transformation phase 2:** Academic and research revitalisation, together with the financial turnaround, growth in student numbers, continued change in the composition of the student body and leadership, appointment of staff from designated groups, more inclusive management structures, and changes in institutional culture (SAd, 2005 – translation)

**Transformation phase 3 :** Incorporation element of transformation: QwaQwa and Vista Bloemfontein campuses (although all expectations have not been met), significant change in staff composition in departments; accompanied by regular appointment of senior black and female managers, further changes in institutional culture; a pioneering approach to community service learning and research (engagement).” (UFS website).

The Senior Academic interviewed stated that, “A comprehensive transformation plan will be drafted to provide this overarching framework and will clearly articulate the transformation challenges faced by UFS” (SAD, 2005), and that the transformation areas in the strategic priorities should be clearly identified.

### ***E.18.1.1 Mergers: three campuses – incorporation***

The merger/incorporation has brought about changes. The increased administrative load has already been mentioned, as well as the newly multicultural student body. Parallel teaching is occurring on the QwaQwa campus.

### ***E.18.1.2 Merger/ Incorporation and data impact***

The Planning Unit mentioned the issue of inaccuracy of data as a result of the transferring of data from the ITS<sup>®</sup> system used on the QwaQwa campus to the UFS system. They have software to correct the problem, especially as it impacts on the HEMIS system. Other opinions were that the transfer of data was not problematic (ITMgm, 2005). This view is supported by other administrative staff.

### ***E.18.1.3 IT support for merger/ incorporation***

On the question of how IT can support transformation, most respondents pointed to eLearning. ELearning is being given support from top management, and this applies to both campuses, through the use of WebCT<sup>®</sup>. Videoconferencing is used successfully at top management level to support management of the incorporated QwaQwa campus. Email is also being used, reportedly with no problems (ITMgm, 2005).

A need was expressed for a web-cam type system to allow easier interaction in faculties as well to facilitate faculty management across campuses (SAc, 2005). The size of the faculties would suggest use of such technology. However, this request was seen as problematic by IT management as they felt there could be security implications with VOIP (ITMgm, 2005).

### ***E.18.1.4 IT support – multiculturalism***

Translation software is used for meetings, translating all documents from Faculty meetings upwards, and is a good innovation, as is the simultaneous interpretation during meetings (Sad, 2005). Otherwise not a great deal of support is offered for multiculturalism. A mention was made that IT could support multiculturalism. Of course, the system of meeting



translation does support the change to a multilingual University, although Sesotho is not yet being used.

#### ***E.18.1.5 Other technology***

The role IT could play has been explored and considered. As mentioned, videoconferencing is being used for meetings.

The goal is to equalise facilities on all the campuses and this includes laboratories and teaching support technology, but it is stated that the remote campus, although keen to use technology, does not have sufficient support.

“There is a role for IT [in transformation], not in teaching perhaps as the community environment is not connected usually, but it can support by tracking projects” (ExMgm, 2005).

As regards data and information, systems were different and data had to be merged. “It was a struggle to ensure data integrity, but there were no major hiccups” (SAd, 2005).

“Incorporation was no problem. Data was downloaded from the ITS<sup>©</sup> system and transferred to the main system electronically” (ITMgm, 2005). By contrast the opinion was voiced that “data merging was difficult and caused inaccuracies in data” (SAd, 2005).

More interesting was the comment that IT has actually caused transformation (reengineering) of processes through the introduction of the new ERP system (SAd, 2005).

#### ***E.18.1.6 IT support for community projects and third stream funding: Community involvement***

The Chief Directorate: Community Service facilitates the integration of academic learning, teaching and research with service to the communities of the Free State, within the context of partnerships.

"In a fast changing world people tend to forget from where they originate. One important component of our existence is the fact that we come from communities, and directly and indirectly represent the needs of our society. Our challenge in South Africa's higher education sector today, is integrating the needs of communities with academic learning, teaching and research. This is what the UFS aims to

achieve through its integrated community service programmes." - The Chief Director: Jaftha (UFS Website).

Currently 52 projects are listed as community projects, many run by departments but others by the Community Services Directorate. (UFS Website)

In addition, community development is a compulsory course for all students (SAc, 2005), and departments are involved in consulting projects in the community (SAc, 2005).

### **E.18.2 Communication Management**

This section overlaps with earlier discussions on information behaviour, as well as the less formal aspects of knowledge management.

UFS is a large University. Communication Management is a vital part of the University and becomes more so as the size increases. For UFS, key questions include: "How does top management keep in touch with the issues discussed by junior academics and students", and similarly, "Are junior academics and students informed about management decisions?"; "How much decision-making transparency exists?"; "Is information adequately captured and made available?"

Top management remains in contact with student needs through an effective SRC system and monthly meetings with the SRC. This appears to be sufficient. A social function for new staff members is held, but after that the faculty system is relied upon to voice matters of concern of junior academic staff and normal management structures for support staff. IT is of little use here. At a higher level, as already described, the executive management meeting minutes of the last five years are stored electronically and are accessible to senior management and this type of information is thus supported by IT.

An opinion was voiced that IT is not helping much with communication, and that strategic information published for external use was better than information available internally (ExMgm, 2005)

As shown in Roets's model for SIPM and the distinction between explicit and tacit knowledge management, IT support for CM needs to be planned for. The two prime vehicles for informal and tacit communications, which tie in with knowledge management

above, are email and the web. Videoconferencing is another technology that supports communications as does a functional PABX.

#### ***E.18.2.1 Communication and Information provision***

The size of the University makes electronic communication a necessary option, and it is not being used extensively enough or to its full potential. However, email and videoconferencing are being used especially as communication with the distant campuses makes this vital for safety and efficiency, but not yet for teaching.

In support, the following was stated: “Electronic communications are good, but not used as effectively as it could be – overload exists. This could be solved by codifying messages. Service workers do not have access. It would be useful to have information in digested form available electronically, but that is not yet a priority” (ExMgm, 2005).

#### ***E.18.2.2 Email***

Email is used extensively to disseminate information, and there is a view that there is an information overload. Staff ignore what they feel is not pertinent, and then afterwards complain that they were not informed. This is a problem that needs solution, and a suggestion was made that information should be coded by subject/category to be more targetable.

#### ***E.18.2.3 Intranet***

The web site is an important communication vehicle. The new IT Director is in the process of getting to grips with this, but one staff member noted that portal software was needed as the present set of static pages (60000 pages was mentioned) made it difficult to maintain. Some centralisation was required, but making changes at user level is difficult. An opinion voiced is that the web site is vital both internally and externally for communications, “but is not seen as a priority” by IT or Management. The author’s opinion is that the web site has a wealth of information but is not easily searchable, possibly because it is static and driven by a database. A clear web strategy is required, as well as the resources/skills to exploit the functionality that portal software provides.

#### ***E.18.2.4 Videoconferencing***

Videoconferencing sites have been set up and are being used especially by top management for contact with the QwaQwa campus on a weekly basis (VC, 2005). This campus is at least 3 hours drive away, and so this form of communication is vital. At least seven sites on the campus support video conferencing. Faculty Deans have tried to use videoconferencing, for the same purpose of reaching the further campus, but found that bandwidth speeds were so slow, that this was a useless form of communication. “Videoconferencing should be a solution but the speed is too slow – tried once for a meeting and it was not successful. There is a lack of bandwidth. An ISDN line is being put in but this is taking time” (SAc, 2005). It would appear that the bandwidth and thus speed has improved, but that this has not been widely communicated, as the Deans were not aware of the change.

#### **E.18.3 Knowledge Management**

The previous section overlaps this section in terms of information provision and usage. However, the focus here is on the more informal communication needs and practices of the University, as well as tacit and explicit knowledge management practices.

Most staff interviewed said that KM did not exist at the University. An opinion voiced was that because of the stability of staff, there had been no need to capture a great deal of procedural administrative knowledge, but that with the new campuses, this lack manifested itself. By contrast, one senior academic was of the opinion that knowledge management is what universities are concerned with, and that HEIs certainly practice knowledge management in teaching and research, but this may not be recognised as such in terms of the new “buzz word”. He agreed, however, that what might be missing is the electronic management of knowledge (SAc, 2005).

IS/ICT support for knowledge management is encouraging. The meeting system used can be viewed as a knowledge management application in terms of capturing and access, where executive management meeting minutes are stored electronically for the last 5 years’ meetings and are electronically searchable. In addition, translation software is used such that all meetings are translated from English to Afrikaans and vice versa.

Email is a prime vehicle for sharing knowledge and is widely used, as noted in the tables (Table E-9; Table E-10; Table E-11; and Table E-12) above.

In addition, because of the requirements of the institutional quality audits being conducted nationally, and because of the requirements of WebCT<sup>®</sup>, a great deal of teaching “knowledge” is captured. The web is a prime area for knowledge sharing (publishing of policies, for example), but opinion suggests that this is not being used optimally administratively as yet (SAC, 2005).

In the narrower definition of knowledge management as relating to Intellectual Property (IP), it was stated that this is becoming a focus area because of the need to generate third stream income. The University has a responsibility to protect IP, as the main source of funding is Government (for research) and this makes Universities accountable to the State for IP management (SAd, 2005). IT could be used to support IP management, as well as the community projects and outreach, by supplying management information and making this information available widely.

A survey was done to estimate the KM practices at the institution using Questionnaire Q4.2 (found in Appendix B).

Respondents: 5 Senior Academics, 2 Administrators and 6 students.

Rating scale: 1 to 5, where 1 = “Poor” and 5 = “Excellent”.

<b>Q4.2 Knowledge Management/ Information behaviour</b>	
<b>Behaviour</b>	<b>User average</b>
An electronic knowledge base exists to store new ideas, knowledge, solutions, and best solutions.	2.1
Documents are proactively shared with employees.	3.5
The development of job documentation is encouraged.	3.3
Information from many sources is stored in an (integrated manner) and cross-referenced, facilitating better communication and decision making.	2.5
No policies or technical security issues prevent the sharing of information and knowledge.	1.8

<b>Behaviour etc</b>	<b>User</b>
Documents can be posted on an organisational (intranet) portal or saved on a network server.	4.2
Proactive as members actively seek out and respond to changes in their competitive environment and think about how to use this information to enhance existing and create new products and services.	3.9
Information is transparent as members trust each other enough to talk about failures, errors and mistakes in an open and constructive manner and without fear of unfair repercussions.	3.9
Incentives are in place that motivate staff to share knowledge.	1.3
The generation of new ideas and knowledge is highly valued.	3.2
The information and knowledge you receive is accurate and up-to-date.	2.8
An organisational intranet portal exists where information and knowledge relevant to job requirements may be retrieved.	1.7
It is common practice to store work documents on an organisational server, rather than on personal computers.	2.4
Electronic and/or non-electronic collaboration, teamwork, and cooperation are a part of doing business.	3.4
Information is stored and organised in a way that makes it (intuitively) easy and quick to locate.	2.5
Advanced technologies, (such as data warehousing, mining, and modelling), are used to leverage data and information for strategic and operational decision making.	1.1
Documents stored on an organisational server or intranet contain timely and useful knowledge for our job responsibilities.	2.5
Expert systems and knowledge bases are used to aid in decision making.	2.6
Average	2.7

**Table E-13 Knowledge Management and Information Behaviour**

The average figure for KM is more than the mid-point of 2.5, which negates some of the negative comments made. The profile emerges from this table of an HEI which perhaps does not have the KM systems in place (both technological as well as in the accepted terms of knowledge processes such as motivations to share documents), but that there is a culture of knowledge sharing, storing and transfer. Mentioned already is the fact that data-warehousing

and data- mining software is being developed for the Planning Unit. This is not reflected in the responses shown, perhaps because this is not widely known or understood.

#### **E.18.4 Other changes**

Decision-making processes and structures in the University were transformed, “Management structures have become flatter and inclusive of all the important role players, and human relations improved between managers to tackling the next transformation phase successfully”(Tabane, 2005). Many senior staff members refer to decentralised management which has been instituted (SAc, 2005, SAd, 2005).

A workshop was organised where transformation issues were discussed, and enabled the members to develop common .goals and approaches to “what needs to be transformed, why it needs to be transformed and how it must be transformed” (UFS website). According to this publication, issues that need consideration are:

- “Diversity;
- Racial discrimination;
- Religious discrimination;
- Age discrimination;
- Sexual harassment;
- Affirmative action concerns;
- Employment equity concerns;
- Hiring and promotion concerns;
- Pay inequities;
- National origin discrimination;
- Sexual orientation “(UFS website).

Several of these issues, such as diversity, discrimination (people must feel ‘at home’ and ‘be themselves” - SAD, 2005), affirmative action, and employment equity are issues that have been defined and discussed as part of transformation needs. Others are broader than that.

## ***E.19 In summary***

### **E.19.1 Context analysis**

The University has changed dramatically in the last 5 years. These changes have been transformational in the narrower sense of State requirements: student demography, appointment of staff from designated groups, research focus and community involvement. It has also transformed in the financial sense, in the cultural sense as well as having adopted a culture of change and entrepreneurship. The University is serious about transformation and appears to be moving forward successfully and purposefully.

Using Porter's "5 Competitive Forces", UFS shows strengths in its management of the "Buyers" of its products – the students - as it has experienced a growth in student numbers (part of the financial turn-around). The "supply" of Afrikaans students is steady.

"Rival firms" are the other HEIs, and private institutions. It caters for the Free State, and attracts the traditional Afrikaans students from the region. It has also become an institution of choice for students from the Eastern Cape, because of the perception of having a well-managed residence system.

"Barriers to entry" are less high for the areas where there is a great deal of growth – Commerce, while for Science the costs are high, thus there is a great deal of competition in the area of Commerce. The fact that it is city-based may provide some competitive edge over its nearest originally Afrikaans speaking university at the smaller town of Potchefstroom, by attracting working and mature students. In addition, the opportunities for consulting for staff in larger centres may make it easier to retain staff in these disciplines at other HEIs.

The threat of substitute products is low as these institutions do not offer the same package that the University does (more restricted offerings, no residential accommodation, not a "real" University experience, amongst others).

In general, the competitive field has been narrowed by Government intervention, specifically the ruling against foreign HEIs operating in South Africa, the attempts to eliminate costly duplication of programmes and regulating which programmes may be offered where.



The University (in terms of the Fourie and Fourie's (2001) adapted diagram) sees itself as balancing the three areas of traditional, redress and market orientation. It is grappling with the problems this stance brings.

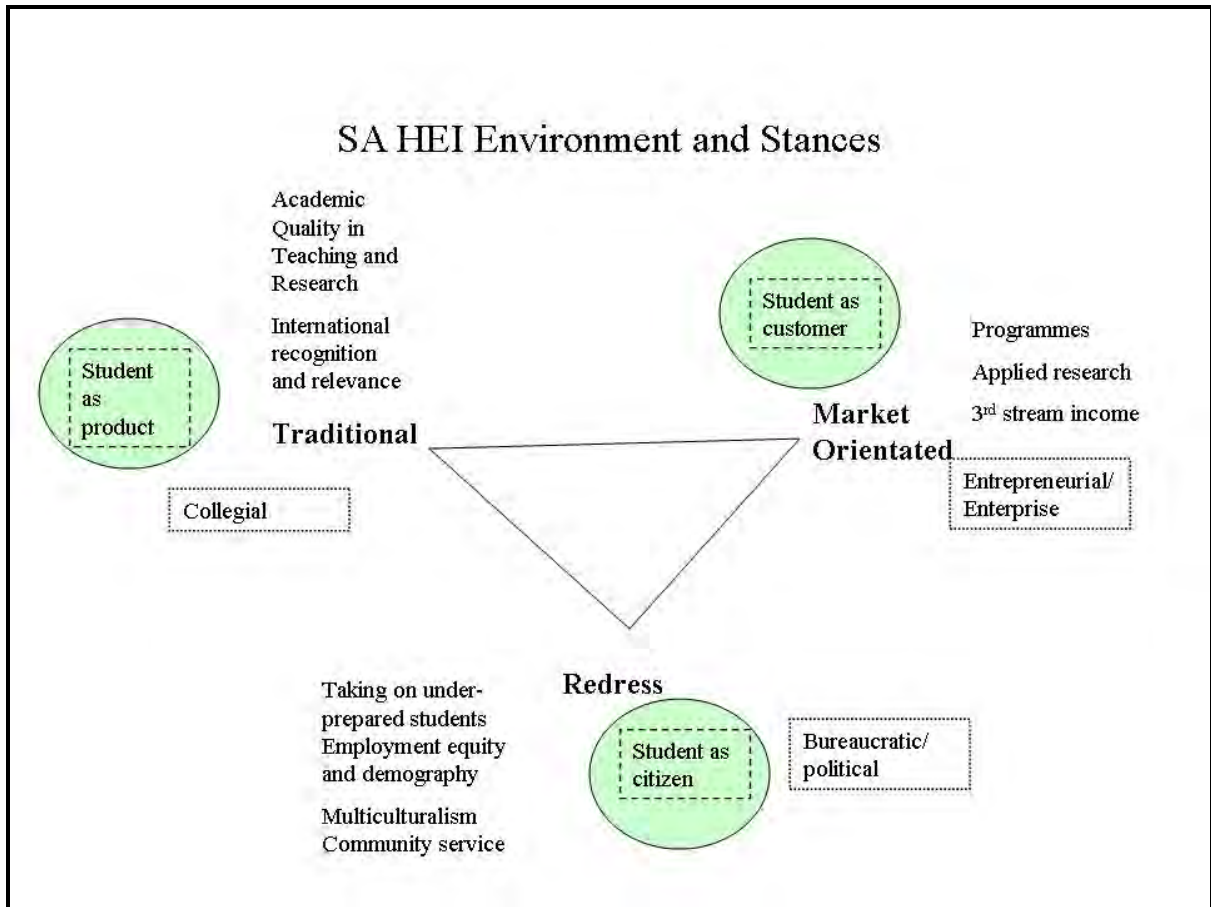


Figure E-7 Balancing competing drives – Roets (2005) - reproduced

### E.19.2 IS/ICT importance

The IT structure with 2 directors is good. However, IT should be reporting at a higher level and showing greater leadership in exploring and introducing new technologies and usage of systems. It is early days with a new system hardly fully installed, and a new director in

place, and there is a good sense of constant striving for greater goals: “This year we are good, but next year we want to be excellent” was the quote from one IT Director (2005).

### **E.19.3 Strategic**

IT is important in the strategic eLearning focus of the University. The decision to move to a new software system was viewed as strategic. However, IT is not seen as majorly important except as a support service. IT alignment is judged at a Stage 1 overall level of maturity (Table E-2).

### **E.19.4 Tactical**

Management has been decentralised, which should support the ability to be more flexible. Given the size of the University, this was an essential move. At management level, decision-making is being supported by the specialised meeting software. Management meeting with the remote campus is being facilitated by videoconferencing at least at senior management levels. Management information is seriously lacking, or at least access to such information is proving a major problem particularly for academic leaders. Academics feel that their needs are not being taken seriously. This view is supported by the skeleton survey results. As regards service quality, the organisation appears well served, with the IT Division rating themselves at 6.9 out of a possible 7, and administration echoing this view at 6.8, but with academics giving a rating of 2.6 and students at 4.8 (Table E-4). This indicates the need to communicate better with academics to establish their needs.

Business process reengineering has occurred among administrative operations, but in the author’s view, for the wrong reasons – not for efficiency of processes (although this could well be the case), but to fit a system that supports different processes. This has allowed for an evaluation of processes, which could well have led to greater efficiencies, but that has not been mentioned. On the contrary, the processes are said to be more involved (at present), because of the requirements of the new system (SAd, 2005). Administrative staff are happy with the new ERP system, however, giving it a rating of 4.1 out of a possible 5 (with academics once again lagging with a rating of 2.4 - Table E-7). Table E-8 echoes the satisfaction with administrative support, while academic services for students lag. Academic

systems have an 83% rating, which is at variance with the perceptions from the other questionnaires. There is thus, once again, possibly a communication gap.

Other packages have been purchased to support some of the functions that are either not being used or not supported by the ERP system, but many do not appear to be delivering as yet.

### **E.19.5 Operational**

Technology exists to assist in the teaching venues, but is not seen to be effectively managed. The residences are wired and although this may have some negative consequences, such as anti-socialism, the facilities to work from places other than the open laboratories exist.

Academic needs and student society needs for systems and information are perceived to be inadequately met. Capturing of course material is not generally practised.

In terms of research, the web publishes useful static information, but no real knowledge sharing is facilitated.

Community projects and consultancy also publish material which is static.

### **E.19.6 Information behaviour**

Information/computer literacy is judged high for the University community - 79% for email and 74% for Word-processing (averaged across the categories). Email, telephone and personal contact are rated as the most used communication channels, with email averaging across categories as the most used (32%, 20% and 30% in Table E-10). When electronic media are used for communications, the effectiveness (judged by response rate) is good for email (73% across categories - Table E-11 ), and the efficiency is slightly less, but still judged at 71% efficiency judged by speed of responses (Table E-12). The information intelligence levels as epitomised by computer literacy and media usage appear to be high, but this can only be judged in comparison with other institutions. What does arise from the responses is the lower rate in almost all categories of information behaviour by students.

### **E.19.7 Knowledge and Communication Management**

Knowledge Management and Communication Management in terms of IS/ICT at the strategic level are neglected as regards IS/ICT given the stage of strategic planning for IS/ICT (in process). IS/ICT support for explicit KM, such as IP management does not exist. The KM rating for the institutions is 2.7 out of a possible 5 (Table E-13).

IS/ICT supported communications are mainly email and a static UFS website. Email is used widely, and is generally a robust form of communication. A huge amount of information can be found on the UFS website, but it is stated that it is not tailored for individual needs. Student portals do not exist. Staff miss important information sent by email because of information overload. The use of subscription groups could help here as well as a suggested coding scheme for email. Publishing on the web could also solve such a problem with an alerting service.

Knowledge management is occurring in teaching and research, and the former is well supported by WebCT<sup>®</sup>, but the research software is not yet operational. Knowledge capturing of processes and procedures is not in place.

The web has a huge amount of information, but support for tacit multicultural knowledge management does not exist, except for the translation software noted above. Little evidence exists of communication support for new staff members, and members of minority groups. Tacit knowledge management is not being examined for value.

### **E.19.8 Transformation**

The University is transforming well, and in some areas the role of IT is certainly aiding in core processes (eLearning) as well as management processes, but it is not (yet) delivering in areas of better multicultural communication, for example, and knowledge management for supporting new staff and students.

IT has proved a temporary disruptive change agent, and the new ERP system has not provided great benefits as yet. The flexibility of the system has not been tested yet as it is still

in a “bedding-down” state, but the fact that processes are adapting to the system and not *vice versa* implies that it is not very flexible (as would be the case for any packaged and complex system).

#### ***E.19.8.1 Success***

Phase 1 as defined by the VC included the introduction of parallel medium teaching, as well as the change in student demography. This is a *fait accompli*. The issue of appointing staff from designated groups is facing the same hurdles at UFS as at other HEIs in SA, as stated earlier, and attempts are being made to nurture staff from the student body.

Already mentioned was the success of the financial turnaround (VC, VP, SAd, SAc, 2005) which falls into the quoted Phase 2. This was achieved by measures such as no salary increases for three years, and voluntary and compulsory retrenchments of staff (Tabane, 2005) as well as increasing the student numbers and introduction of a limited distance education offering (SAd, 2005).

The third phase, the incorporation of the two new campuses, is in process, and UFS has appointed senior staff to drive its “community service learning and research” approach (SAd, 2005).

From the VC’s address on the UFS website, the following having been achieved regarding institutional cultural issues:

- “Promotion of multilingualism via new language policy (although its application not always easy, requires innovative thinking...)”
- More diverse (‘culturally-representative’) building names
- Moshoeshoe project towards a shared sense of history
- Multicultural sensitisation workshops
- Social contract workshops: building a sense of shared values for a multicultural workplace, to create a sense of belonging
- But still a strong sense of alienation amongst black staff.” (UFS Website)

Given the focus on continuous change, a very real feeling of positive change is evident among staff, and a view that the change would be a way of life. This feeling of change was particularly evident from IT management where many responses to questions were stated as being *status quo* answers, but that changes were in progress, if not yet in evidence. Strategic planning (SIPM), building communication channels, as well as establishing policies were amongst the ones specifically mentioned. The “new” IT Director came from the private sector and had “a good communication style and approach” which was seen as positive (SAc, 2005). A feeling of energy and commitment is apparent.

## **E.20 Exploratory areas**

### **E.20.1 IT leadership**

IT leadership is usually equated with innovation. At UFS, it was stated that more leadership could be shown by IT (SAc, 2005). “IT is neglected. It has been lacking in proactive leadership. It is just there. Modernising of IT is a continuous process” (ExMgm, 2005). However, as noted previously, especially with the appointment of a new IT Director for computer services, change is in progress in this regard.

### **E.20.2 Feedback loop**

The use of IS/ICT as a cybernetic control loop for certain academics such as tracking of decisions, and implementation thereof, is not being used at present.

### **E.20.3 Process reengineering**

The installation of the new system has caused an organisational process reengineering. This has caused a re-evaluation of all the processes, especially for the support units. The ERP was chosen for its support for “best-practice” processes. However, since this is an American package, some of the practices do not fit conditions or established processes. This has caused problems common to installation of ERP systems, such as increased workload for administration. Some support units have expressed themselves happy with the changes, while noting problematic areas. Ideally, the processes should be examined to see how IS/ICT can improve efficiency and effectiveness.

#### **E.20.4 South Africa**

The South African issues that are pertinent to HEIs such as skills shortages, broadband, budget or resource squeezes and technology costs, and levels of computer and information literacy have not been mentioned as problematic. Indeed skills and resources have been stated as being NOT problematic (ITMgm, 2005), and the broadband issue has been resolved at least as far as videoconferencing is concerned.

#### **E.20.5 Achievements**

The success of the installation of the new ERP system was seen as a major achievement by one of the IT Directors, while the other saw innovation regarding ICT problem-solving and solutions by staff members as another noteworthy achievement. The responses from the questionnaires show that the administrative systems serve the support units admirably.

### ***E.21 Conclusion***

Transformation is occurring in a controlled way. Organisational strategic management is flexible (annual review), the structures have been flattened and decentralised management has been initiated. As a “learning organisation” the attitude of changing and improving is prevalent. The administrative processes have been quoted as perhaps requiring some attention.

IT is not as yet formally aligned. Its structures and reporting lines are clear and effective, although its strategic position is low. It is in the process of improving governance, where there appears to be room for improvement in terms of policy and also possibly the effectiveness of the committees involved. Although there is disagreement on this, it appears to be under-resourced on skills. Opinions on service levels diverge. As regards operational support, there is a great deal of support for eLearning, but less so for academic leaders. Indeed this appears to be a serious issue of concern. Communication management and knowledge management have not been explicitly planned for in terms of IT. Some knowledge management is occurring. More could be done with communication management in support of multiculturalism.

## Appendix F Explanatory notes

### ***F.1 Centre of Excellence***

“Telkom's Centres of Excellence (CoE) Programme is a collaboration between [Telkom](#), the telecommunications industry and the South African government to promote a culture of excellence in research in information and communication technology, and to provide facilities to encourage young scientists and engineers to pursue their interests in South Africa (Telkom Centre of Excellence).

Launched in 1997, the CoE programme is growing local telecommunications and information technology skills, is yielding substantial benefits for the universities and technikons involved, and is helping [Telkom](#) its development partners to solve technical problems and reduce costs. Rhodes University's centre was one of the first to be recognised formally by the programme.

The CoEs are jointly funded by [Telkom](#), telecommunications players in the private sector, and the [Department of Trade and Industry](#) - through its [Technology and Human Resource for Industry Programme \(THRIP\)](#). There are currently 16 CoEs, located at tertiary institutions around the country. In addition to developing skills in science, engineering and technology, the centres are aimed at creating partnerships between historically disadvantaged and advantaged institutions. The institutions are paired; with a previously disadvantaged and an advantaged institution sharing a CoE in which to jointly focus on a specific aspect of telecommunications research. This provides for the transfer of skills and the upliftment of the previously disadvantaged institution.

Skills retention for South Africa is also a significant benefit of the programme. Many talented post-graduate students are attracted to opportunities overseas, and the CoE programme <http://www.telkom.co.za> is demonstrating that they don't have to leave SA to do exciting work.”

### ***F.2 Institutional Forum***

The functions and powers of the IF are laid down in section 31 of the Higher Education Act (Act 101 of 1997):

- (a) the IF must advise the Council on issues affecting the University, including–
  - (i) the implementation of the Act and the national policy on higher education;
  - (ii) race and gender equity policies;



- (iii)the selection of candidates for senior management positions;
  - (iv)codes of conduct, mediation and dispute resolution procedures; and
  - (v)the fostering of an institutional culture which promotes tolerance and respect for fundamental human rights and creates an appropriate environment for teaching, research and learning;
- (<http://www.sun.ac.za/if/index.htm>)

### **F.3    TENET**

TENET is a structure formed to support HEIs in their technology requirements. Tertiary Education Network (TENET) was founded in August 2000, “jointly by the Committee of Technikon Principals (CTP) and the SA Universities Vice-Chancellors' Association (SAUVCA). Each of these bodies appoints four Members of TENET”

The purpose of TENET is

- “to secure, for the benefit of South African Universities and Technikons, Internet and information technology services, involving, inter-alia
- the management of contracts with service providers;
- ancillary operational functions in support of service delivery; and
- the provision of other value-added services as may from time to time be needed in support of the higher educational sector in South Africa”. (TENET homepage)