

# **UNIVERSITY OF KWAZULU-NATAL**

## **The Impact of Institutional and Information Systems Strategy Alignment on Academic Computing Divisions within Higher Education**

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## DECLARATION

I **SACHIN SUKNUNAN** declare that

- (i) The research reported in this dissertation/thesis, except where otherwise indicated, is my original research.
- (ii) This dissertation/thesis has not been submitted for any degree or examination at any other university.
- (iii) This dissertation/thesis does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from other persons.
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## ACRONYMS AND ABBREVIATIONS

<b>AC</b>	Academic Computing
<b>CEO</b>	Chief Executive Officer
<b>CIO</b>	Chief Information Officer
<b>COO</b>	Chief Operations Officer
<b>DVC</b>	Deputy Vice-Chancellor
<b>HE</b>	Higher Education
<b>ICT</b>	Information and Communication Technology
<b>ICTS</b>	Information and Communication Technology Services
<b>IS</b>	Information Systems
<b>IT</b>	Information Technology
<b>SA</b>	South Africa
<b>UCT</b>	University of Cape Town
<b>UKZN</b>	University of KwaZulu-Natal
<b>UP</b>	University of Pretoria

## **Abstract**

Information Systems play a vital and dominating role in business today by enabling as well as supporting business objectives and goals. As a result, the alignment of Information Systems strategy and business strategy has become a core concept in many organisations. The question that naturally arises is whether this is also true for Higher Education institutions in developing countries. This study examined the alignment of institutional and Information Systems strategy and its impact on Academic Computing divisions within Higher Education. It set out to determine if there was a link between the vision and mission of Information Systems and institutional vision and mission. This was achieved by critically evaluating current Information Systems strategy in relation to the institutional strategy and by determining the effectiveness of the current Information Systems strategy in the area of Academic Computing. In order to fulfil the objectives of the study, questionnaires were sent to a population of 22 Information and Communication Technology directors/managers at 22 universities in South Africa. In-depth interviews were conducted with senior Information and Communication Technology directors from two universities that reflected strong alignment between Information Systems Strategy and institutional strategy. Both universities also possessed strong and effective Information Systems strategy in the Academic Computing component. It was evident that alignment was the key to their effective Information Systems strategy. The overall findings of the study show that there is a strong link between the vision and mission of the Information Systems and institutional mission and vision. The Information Systems strategy in place was effective for the various institutions; however, it was not effective in the area of Academic Computing in most institutions. The need for a more enhanced Information Systems strategy in Academic Computing was acknowledged. Institutions should emulate leading universities in South Africa and first-world countries in respect of continuously adjusting and evaluating alignment between Information Systems and institutional strategy. An enhanced Information Systems strategy in Academic Computing is also required.

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# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Introduction**

There is a paucity of research on the alignment of Information Systems (IS) strategy and institutional strategy and its impact on Academic Computing in the Higher Education setting in South Africa. A literature review reveals that considerable research has been conducted on this topic in first-world countries. Pirani and Salaway (2004) examined the alignment of technology in a Higher Education setting. Kraftner (2006) highlighted the impact of the alignment of IS and institutional strategy at Bournemouth University. Georgina and Olson (2007) examined the alignment and integration of technology and its impact on the teaching process. These studies showed that alignment of the two strategies produced positive results in Higher Education. The motivation for the current study is therefore the lack of literature and research in the area of IS and institutional strategy alignment in developing countries, including South Africa.

This chapter presents the problem statement, and the research questions and objectives of this study. This study will examine the alignment of institutional and IS strategy and its impact on Academic Computing divisions within Higher Education. This will be achieved by determining if there is a link between IS and the institutional vision and mission; by evaluating the current IS strategy in relation to the institutional strategy; and by determining the effectiveness of the current IS strategy in the Academic Computing component.

### **1.2 Motivation for the Study**

First-world countries have adopted and promoted new and innovative methods in the use of IS in Higher Education. The literature review revealed that developed countries exhibit a strong alignment between IS and institutional strategy, which in turn produces stronger IS than developing countries. Portland University in the United States of America (USA) is an excellent example, with state-of-the-art IS and advanced technology across the entire university (Ahmed et al. 2007).

- This research will contribute to the area of IS and institutional strategy alignment. It will further contribute to the area of Academic Computing in Higher Education. Limited research has been carried out on IS strategy alignment and its impact on Academic Computing, especially in developing countries. This study will provide data from a developing country i.e. South Africa.
- This study will give a snapshot of where South Africa is placed in terms of IS strategy and how systems and strategies could be improved to match those of first-world countries.
- Academics, students and the executive management of universities will benefit from this study as increased alignment of institutional and IS strategy will have a beneficial impact on Academic Computing.
- Information Technology (IT)/IS departmental staff will also benefit in terms of understanding the issue of IS and institutional strategy alignment. IT and IS systems will become a core support of the overall institutional strategy and will add value to the work done by IT/IS staff.

### **1.3 Focus of the Study**

South Africa is a developing country, and its Higher Education institutions are also still developing. Transformation of various systems would enable these institutions to follow the example set by developed countries. IS could play a pivotal role in the transformation of a Higher Education institution. A clear example is Libya, a developing country, which adopted ICT in Higher Education as a vital aspect of its overall strategic development plans (Rhema and Miliszewska 2010).

The appropriate role of IS in an organisation is typically characterised as a fit or alignment with the strategic goals of the organisation (Olugbode et al. 2007). The IS strategy itself is a key factor in adopting critical IS. Proper alignment of the IS strategy with organisational strategy is fundamental to achieving the overall organisational goals and objectives.

This study focused on the alignment between IS and institutional strategy in Higher Education in a developing country, South Africa. The methodology adopted for the study

included questionnaires and in-depth interviews with representatives of recognised universities within South Africa. The study also focused on the Academic Computing component, which consists of teaching, learning and research. The main area of focus was the alignment of IS and institutional strategy and the impact of this alignment on the Academic Computing components in these Higher Education institutions.

#### **1.4 Problem Statement**

A literature review reveals that that IS in Higher Education in first-world countries have proven more effective compared with third-world and/or developing countries. This research will therefore investigate if there is alignment between IS strategy and institutional strategy in Higher Education in South Africa. This is supported by general observations of current IS at a local university, the University of KwaZulu-Natal (UKZN), which exhibits a lack of IS and IS strategy. The alignment of institutional and IS strategy is fundamental to an effective IS strategy, which further contributes to effective IS. Hence a lack of alignment can lead to poor or inadequate IS. This study will provide insight into improving the alignment of IS and institutional strategy. It begins with a comprehensive picture of the views of IT/IS managers/directors at different universities across South Africa and establishes the link between IS strategy and institutional strategy.

Another avenue where IT/IS is used vastly is in the field of Academic Computing. IT/IS is widely used in the field of Academic Computing. Academic Computing is often referred to as the use of IT/IS in the areas of teaching, learning and research (the core functions of a university) to enhance and facilitate teaching and learning methods. The general IS infrastructure at the “Premier University of African Scholarship,” UKZN, consists of telecommunications, administration support systems, Academic Computing and end-user support. However, according to the UKZN ICT Director (2010), there is limited use of IS or IS strategy in the Academic Computing component. Currently, UKZN uses a system called Moodle, a learning management system that is the only system available in Academic Computing. This demonstrates the need for more effective IS in the Academic Computing component. This study will hence investigate the impact of institutional and IS strategy alignment on Academic Computing divisions within Higher Education.

This study will revolve around the Organisational Culture Theory (Schein 1988). It will focus on the organisational attitude towards alignment of IS strategy with its own strategy with a view to enhancing the quality of Academic Computing.

### **1.5 Research Questions**

- What is the extent of the synergy between IS vision/mission and the institutional vision/mission at South African Higher Education institutions?
- How effective is the IS strategy in the area of Academic Computing (from the research participants' perspective)?

### **1.6 Objectives**

The objectives of this study are:

- To determine the link between the IS vision and mission and the institutional vision and mission.
- To critically evaluate the current IS strategy vis-à-vis the institutional strategy by assessing the opinions of IS personnel from selected Higher Education institutions in South Africa.
- To determine the effectiveness of the current IS strategy in the area of Academic Computing.

### **1.7 Limitations of the Study**

- The population size was limited to 22 as the study aimed to recruit only IT/IS directors or Chief Information Officers (CIOs). The study was based on responses from senior IT/IS management. The only way the population size could have been increased was to include other IT/IS job profiles or include other universities outside South Africa.
- Identifying and targeting respondents. This was a challenge because the participants

had to be located via their institutional websites. There was limited information and some participants were not listed on the relevant websites. Other participants were contacted via their personal assistants. Since these participants were senior IT/IS personnel within the institution, they had pre-planned schedules which presented a challenge in obtaining their participation.

- Survey correspondence was sent via email. Tardiness in responding was another challenge.
- The study concluded that there is a link between IS vision and mission and the institutional vision and mission; however it could not quantify the extent to which this link exists.
- The second aim was to critically evaluate the current IS strategy vis-à-vis the institutional strategy by assessing the opinions of IS personnel from selected Higher Education institutions. While the results achieved this aim, apart from the University of Pretoria (UP) and the University of Cape Town (UCT), the current IS strategies at Higher Education institutions are not fully known.

## **1.8 Summary**

It is evident that there is a need to conduct research on the alignment of IS strategy and institutional strategy. The greater need is to investigate the lack of IS strategy in the area of Academic Computing. This study will explore IS strategy in South African universities and take an in-depth look at IS and institutional strategy alignment and the area of Academic Computing. While there is rich literature on this issue in first-world countries, there is a paucity of research in South African settings. The study will also challenge other researchers to conduct further studies on issues that have arisen from this study. The following chapter provides a detailed literature review based on studies conducted in the area of IS strategy alignment and IS strategy in Academic Computing. This will provide the framework for the current study.



## **CHAPTER TWO**

### **Review of Key Literature of Relevant Studies conducted in the area of IS strategy in Higher Education**

#### **2.1 Introduction**

The purpose of this chapter is to provide a theoretical background for this study. This chapter will begin by defining the terms relevant to the study. It will provide insight into key areas of focus such as Information System (IS) strategy, and alignment and the importance of alignment between IS and Institutional strategy within a Higher Education institution. Academic Computing is an important area of focus in a Higher Education institution and this, along with alignment of IS and institutional strategy, will be one of the key focus areas of this chapter. The current IS strategy at a local university will also be looked at. The IS model applied in this study will also be defined and detailed in this chapter. This chapter will provide a review of key literature on IS alignment in Higher Education as well as IS strategy in Academic Computing.

#### **2.2. Literature Review**

An IS is built around an Information Technology (IT) infrastructure and provides a platform of interaction between IT and users. According to Chen et al. (2010), IS combined the technical mechanisms and human activities within the organisation, as well as describes the process of managing the life cycle of organisational IS. Information Technology is of considerable importance in academic communities. IT is widely used in the field of Academic Computing. Academic Computing refers to the use of IT infrastructure and services to facilitate and sustain the management and administration of programmes within teaching, learning and research (Mokhtar 2005). It was observed that it is difficult for IT leaders to achieve alignment, and IT alignment within an institution was a general indicator of the priorities of an institution (Pirani and Salaway 2004). In the business sector, alignment of business with IT indicated continuous improvement in overall business performance (Barroero et al. 2010).

### **2.2.1 Information Systems Strategy**

According to Mintzberg (1994), strategy was all about perspective, which revolved around a vision driven by direction. Porter (1996) argued that strategy involved assuming a competitive position, and being able to use strategy to differentiate oneself from one's competitors and as a basis to add value to one's product or service. According to McNurlin et al. (2009, cited in Pollack, 2010), strategy denoted the direction a company wants to go in and how it intends to get there. This is complemented by a plan that depicts a view of the future that guides decision-making. Bush et al. (2009) asserted that a strategy was a long-term plan for achieving organisational objectives while taking into account the characteristics of the current environment. While there are many definitions of the term, simply put, strategy is all about a game plan, a set of objectives or synchronisation of resources that are intended to help an organisation attain its goals. When strategy is linked with IS, it becomes IS strategy. Chen et al. (2010) provided three definitions of IS strategy, namely: IS strategy was the use of IS to sustain a business strategy; it was the master plan of the IS function; and IS strategy was the shared view of the role of IS within the organisation. According to Pearlson and Saunders (2007), IS strategy was the plan that an organisation used to provide all its information and technology services. IS strategy can hence be seen as the strategic use of IS by an organisation in order to meet its goals and objectives and at the same time attain competitiveness.

### **2.2.2 The Importance of Institutional and Information Systems Strategy Alignment**

According to a statement by Jordan and Tricker (1995), there was a need for strategic planning for the expansion of IS and the IT that supported it in large organisations, especially as costs rose, organisational impacts increased and the strategic, competitive potential of the application of IT emerged. Alignment can be defined as a continuous process involving management and design sub-processes and interconnecting all components of a business with the aim of contributing to the organisation's performance over time (Maes et al. 2000). Alignment can also be defined as the appropriate arrangement of groups or forces, or positioning, or adjustment of parts, in relation to one another (Pirani and Salaway 2004).

Pirani and Salaway (2004) added that in an IT/IS department or organisation, proper alignment within the institution became more important as technology emerged as a common thread in institutional activities. This would mean that in most circumstances, the actions of

the institution and the IT/IS entity would affect the decisions of the other. A better definition of alignment with regards to technology was provided by Hoque et al. (2005, cited in Pollack 2010, Pg 47), whereby technology enabled, supported and was unconstrained in an institution's current and emerging business strategy. This in itself indicates the importance of alignment of both strategies. Bush et al. (2009) provided a good example of how proper alignment of IS and organisational strategy could improve performance. An organisation sets a financial objective (organisational objective), and implements a cost cutting IS strategy to achieve it. The example quoted by Bush et al. (2009) was the acquisition of a new, automated client appointment scheduling system that phoned clients with reminders (and freed employees from phoning them). This was an IS that was aligned with the organisational strategy, and it contributed to the organisation's performance. Bush et al. (2009) asserted that the alignment of IS in support of such organisational objectives and strategies had been among the top IT concerns of management in organisations in general for more than two decades. The even longer-standing belief behind alignment is that when any area of an organisation takes action to support the overall strategy, this helps achieve the objectives top management views as critical to the organisation's success.

The appropriate role of IT in an organisation is typically characterised as a fit or alignment with the strategic goals of the organisation (Olugbode et al. 2007). IT can only be appropriately aligned when the infrastructure put in place to implement the IT strategy is adequate and once accomplished, the strategy supports the organisation's strategy and business processes. This supports the importance of the alignment of organisational and IS strategy to improve organisational performance. When a specific area of the organisation implements an IS to support the overall organisational strategy, the system in essence provides a means to help top management realise its objectives and thereby enhances performance (Bush et al. 2009). This related well to Pollack (2010)'s observation that many organisations made technological decisions and acquisitions that impacted on organisational IS on the basis of opinions from vendors or colleagues from other organisations. This resulted in decision-making and expenditure becoming unpredictable. To curb this, most organisations insisted that IS related decisions should be made with a clear understanding of business and organisational strategy and direction. This meant that an organisation must look within itself to realise the potential of effective IS driven by the business/organisation strategy (Pollack 2010). This resulted in control over the process, meeting objectives and minimising of

unpredictability. Again, this is made possible through proper alignment of organisational and IS management strategies.

Pollack, (2010, Pg 47), citing Bechor et al. (2009) noted that, “the pervasive nature of IS in today’s organisations coupled with increased pressure to leverage technology assets had dramatically increased the importance of strategic IS planning.” The strategic planning referred to relates to organisational and IS alignment. Haag et al. (2004, cited in Olugbode et al. 2007) demonstrated how effective IS could be utilised to achieve Porter’s three frameworks of strategic advantage. The areas identified were various aspects of business operations where IS could be strategically applied. These included electronic management, finances, market intelligence, and telecommunications and cost leadership. Olugbode et al. (2007)’s study aimed to show the benefits of incorporating IS into business and conveyed the outcomes of aligning both strategies. The study described how an incorporated IS strategy was adopted to support the achievement of the organisation’s strategic goals. It showed that the introduction of a new, business related IS integrated into the major business areas in the organisation significantly enhanced operational efficiency and profitability. Furthermore, the company that participated in the study was able to develop its business competitiveness by achieving improved cost control, operational efficiency and market targeting. These objectives were not easily obtainable before the introduction of IS.

Chen et al. (2010) presented three conceptions of the role of IS strategy in an organization:

- 1) IS strategy was the use of IS to support the business strategy;
- 2) IS strategy was the master plan of the IS function; and
- 3) IS strategy was the shared view of the role of IS within the organisation.

Chen et al. (2010) concluded that the shared-view of the IS role within the organisation best fitted the definition of IS strategy. This highlighted the fact that strategic alignment was an ongoing process dictated by the organisation’s top IS and business decision makers, rather than an outcome derived by its conformity with the organisation’s developed business strategy (Preston and Karahanna 2009, cited in Chen et al. 2010). This meant that an IS strategy could be developed to either support or alternatively drive a business strategy,

allowing for a dynamic form of alignment. This illustrates that an IS strategy worked best when it was a shared-view in an organisation, as this would lead to the relative alignment of IS and organisational strategy. This was supported by Reich and Benbasat (2000) who asserted that IS alignment involved a communication process that connected the organisation's members to the organisation's strategic goals. According to Pearlson and Saunders (2006), business strategy drove all other strategies; therefore organisational and information strategy were dependent on the business strategy. This implied that changes in one strategy required changes in the other strategies to maintain balance. This is depicted in Figure 2.1 below:

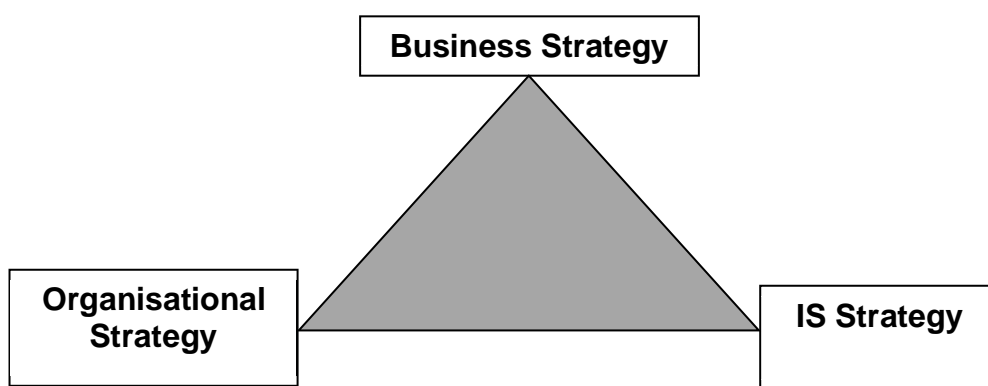


Figure 2.1: Information Systems Strategy Triangle (Adapted from Pearlson and Saunders, 2006)

As shown in Figure 2.1, IS strategy is all about the right balance. In order for business strategy to work, it needs to balance with IS and organisational strategy. This can be achieved by means of the proper alignment of IS and organisational strategy. Business strategy was all about how an organisation functioned as a business unit and was initiated with a mission and a synchronised set of activities to fulfil objectives, purpose and goals (Pearlson and Saunders 2006). This strategy was adopted in response to business competition and dealt with aspects such as cost leadership, market performance and overall competitiveness. Organisational strategy was concerned with human capital, work processes, configuration, and strategies that enabled business goals to be achieved. IS strategy was the plan that an organisation used to provide IS strategically for the achievement of the business goals (Pearlson and Saunders 2006). There needed to be equality in the two forces, IS strategy and organisational strategy pushing towards successful business success.

Figure 2.2 below depicts the value of IS/ Organisational alignment:



Figure 2.2: Equal IS/Organisational alignment (Adapted from Maharaj, 2010).

It is evident from Figure 2.2 above that both IS and organisational strategy are of paramount importance in overall organisational success. They contribute equally to the success of any organisation. The dot signifies the point the organisation wishes to be at in terms of overall organisational success, which is where the arrow is pointing. Too much leverage on either side will skew the arrow and it will no longer point to the dot. This would mean misalignment and non-effectiveness, leading to the organisation not meeting its desired goals. Too much leverage from the IS strategy side will cause the organisation to become more IT/IS driven and too much leverage from organisational strategy will totally undermine the potential of IS/IT, which will lead to IS becoming just a support tool with no direction or strategy (Maharaj 2010).

Alignment of IS strategy with business strategy serves as a basis for consensus between the organisation and IS itself. Tai and Phelps (2000 p. 165, cited in Chen et al. 2010) noted, “it basically ensures that all members of an organisation are heading in the same direction” and consequently leads to “building some consensus regarding the role of IS vis-à-vis the rest of the firm and the resources that will be committed to achieving that role.” This is a vital starting point as nothing can be achieved in business without consensus. Chen et al. (2010) observed that a shared view of the role of IT provided a basis for an organisational

perspective on how to invest in and utilise IS for strategic goals; this provided a doorway into how new technologies could shape the business strategy of the organisation and promoted organisational goals.

Johnson and Lederer (2010) asserted that IS and organisational alignment would positively influence IS's contribution to organisational performance, such as improved customer satisfaction, market share, sales revenues, return on investment, and operating efficiency. This underlines the point made by Bush et al. (2009, Pg 447), who demonstrated the negative effects of a failure to align IS and organisational strategies. They noted that, "an organisation's failure to align the Information System with its strategies can result in lost opportunities, wasted resources, and consequent unfavourable performance."

Organisations may sometimes acquire an IS, but fail to implement it in such a way that is able to support organisational strategy, achieve objectives and enhance performance. This would result in the loss of time and money and wasted opportunities and resources. The absence of alignment has been mooted as the reason why many businesses fail to realise the value of investments in IT/IS, while greater attention to IS and business strategy alignment leads to business advantage (Kearns and Lederer 2000). If IS and business strategy alignment was not achieved, the technology would only take the business up to a certain level and the real potential of IS strategy and technology would never be realised (UP ICT Director 2011).

Failure in alignment can be due to a number of challenges. Even though some organisations may be aware of the value of IS and organisational alignment, achieving it can be challenging (Bush et al. 2009). These challenges can be attributed to numerous factors, including IT staff who do not understand business issues, lack of leadership in the management of IT, a lack of senior executive support for IT and, most importantly, the absence of close relationships between IT and business management.

Alignment of IS and organisational strategies can also enhance an organisation's competitive advantage (Tanlamai 2007). Tanlamai (2007) observed that the use of IS to sustain a competitive advantage had been researched using Porter's competitive strategies concept. Computers were still being used for tasks such as mundane recording, or reporting and analysing the efficiency of internal operations, instead of being utilised as a competitive function (Tanlamai 2007). Coleman and Papp (2006) noted that considerable attention needed

to be dedicated to IS as well as other organisational processes and that organisations function well when they are synchronised. If these two strategies are misaligned, problems will occur, which in turn will prevent the organisation from being as competitive as it should be. Innovation through IS would lead to a strategic advantage in any business and this would enable a business to be an IS leader over its competitors (Piccoli and Ives 2005). While many organisations express the desire to invest in effective IS to improve performance and profitability, what they may fail to understand is that effective IS is not only based on what it does or its technological make up, but on how it is adopted (Coleman and Papp 2006). This can be achieved by an organisation carefully analysing how it wishes to improve its performance and choosing appropriate IS to support this goal. This again reiterates the importance of alignment and the fact that only by achieving proper alignment of both organisational and IS strategy can an effective IS can be adopted. It is important to understand that alignment does not only denote the co-existence of two strategies, but how the alignment of the strategies can add to competitive advantage in any sector (Baker et al. 2010). This is also the case in Higher Education.

The alignment of IS strategy with organisational strategy is not only important in the business sector; it also plays a vital role in non-profit environments. It is relevant to government, research and technology, and health, as well as the education sector. According to Bush et al. (2009), IT played a progressively more fundamental role in the United States health care industry. IS investment in this sector contributed greatly to improved service quality, operational efficiency, patient satisfaction, and patient care. Bush et al. (2009) noted that further investment in and increased use of IS in healthcare could save an additional \$162 billion per year. Bush et al. (2009)'s study found that the alignment of IS strategy with organisational objectives and strategy had surfaced as a significant issue in contemporary organisations. Executives and managers view alignment as the key to realising the value of their IS investment, because it focuses the organisation on achieving its objectives.

### **2.2.3 Relating IS and institutional strategy alignment to Higher Education**

There are considerable differences between business and profit-driven organisations, on the one hand, and public Higher Education institutions, on the other. Public higher education's primary objective is not to make a profit. The purpose of Higher Education was to pass a social, cultural, scientific, political and technological heritage on to the next generation, who



are then able to test, reject and recreate part of it (Milliken and Barnes 2002). The Committee of Economic Development (2009) noted that Higher Education was a multifaceted platform with a number of diverse institutions serving many different audiences. Higher Education helped develop the mindset and skills necessary for effective learning, which prepared students in many different ways i.e. direct and indirect engagement in academically productive and rewarding activities (Committee of Economic Development 2009).

As early as 1996, Allen and Wilson (1996) discussed the potential of IS strategy in Higher Education. They asserted that an IS strategy was the platform for the overall strategic direction of all information and IT related functions within a Higher Education institution. The objective of the information strategy would be to synthesise the managed information resources to which the institution has access and the available IT resources to deliver effective information services across the institution (Allen and Wilson 1996). According to Allen and Wilson (1996), a number of 'internal' factors were also driving the process of IS strategy, as many Higher Education institutions recognised that efficient and effective management of information would be critical to their future success.

Similarly, Georgina and Olson (2008) made the point that the primary task of a technology based IS infrastructure was to support both instructional technology and student learning technology. This included technology to enhance and support communication between students and instructors. There is no doubt that first-world countries have adopted and promoted new and innovative methods in the use of IS in the Higher Education sector. Kraftner (2006) noted that Bournemouth University, a first-world university, adopted new IS supported by modern technology, which included distance learning, virtual learning environments, new media technologies and wireless computing. The case of Bournemouth University illustrated how some universities from first-world countries were integrating effective IS strategy into institutional components. Kraftner (2006, P 4) added that Bournemouth University's ultimate vision of IS Strategy was to support the University's strategic plan and to develop, deliver and support IS. This made the University a better and more attractive place to work and study and provided an improved learning and teaching experience. Good IS strategy entailed IS that met the academic/administrative demands of the University regarding functionality, and promoted effectiveness and efficiency in the delivery of teaching, learning, as well as research (Kraftner 2006). These are just some of the leading universities from first-world countries have incorporated effective IS strategy into their

missions and visions which has contributed to proper alignment, shared views and a unified direction towards a successful future. This is all possible again through proper alignment of IS and institutional strategy.

The Economics Intelligence Unit (2008, p6) provided the example of improvements in Academic Computing in New York University's top-ranked tax law programme. Courses were filmed using cameras and audio visual aids. They went online within 30 minutes and, within 24 hours, students could click an online index that graphically depicted the content of the entire course and could view the portion that was relevant to them. This significantly improved the educational experience. It enabled the dynamic delivery of content that supported individually paced learning. Sophisticated learning-management systems and enhanced video and presentation tools were among other innovations that were having a profound effect on the academic experience. This again illustrated how some universities in first-world countries that have adopted effective IS in Higher Education thereby aligning IS strategy with institutional strategy (Economics Intelligence Unit 2008).

Referring to Higher Education in Libya, Rhema and Miliszewska (2010) noted that over the past 20 years, developed countries had introduced ICT to enhance all sectors, including the educational sector. This had a significant impact on curricula, teaching methodology, and the learning processes. The emerging influence of technologies on all spheres of life, including education, required developing countries to incorporate technology in their education systems. This is achieved by following the example of the developed (first-world) countries (Rhema and Miliszewska 2010). There is a need to close the gap between first-world Higher Education institutions and those in developing countries. This again comes down to alignment of institutional and IS strategy.

Challenges in attaining alignment of IS and organisation strategy in Higher Education do exist (Pirani and Salaway 2004). The focal point of IT/IS alignment within an institution was a general understanding of that institution's priorities (Pirani and Salaway 2004). However, in the Higher Education environment, individual colleges frequently operated as independent entities, creating individual organisational cultures and managing many academic, research, and administrative activities locally. IT management could be caught up in this practice, which may lead to contradictory priorities at both the institutional and technology level (Pirani and Salaway 2004). Higher Education institutions are extremely diverse in terms of

size, complexity, vision, mission, organisational culture and leadership and so on. While there is thus no one-size fits all strategy, alignment can be achieved if both IS and organisational management think strategically. Successful strategic thinking depended on successful interaction among campuses and IT leadership, as it could not just be done in bits and bytes (Pirani and Salaway 2004). Collaboration is a vital aspect of proper alignment. Collaboration between management and IT/IS management is the core starting point of alignment between organisational and IS strategy.

Collaboration between IT/IS and business management was a prerequisite to attaining alignment and this must occur at all levels of an organisation (Campbell et al. 2005). Figure 2.3 depicts the essence of collaboration between organisational management and IS management.

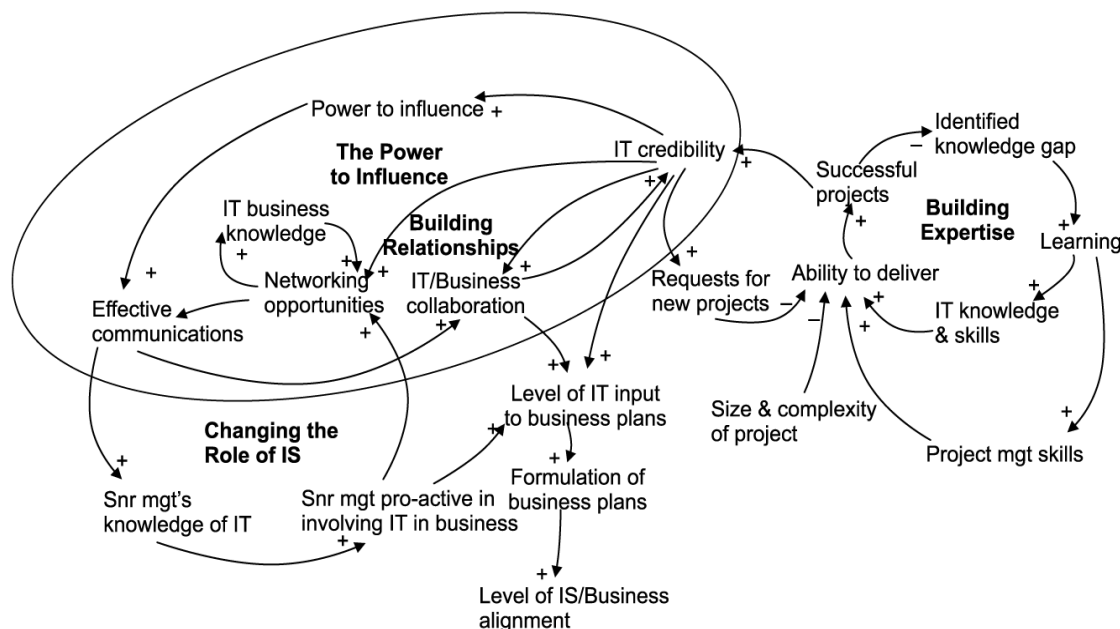


Figure 2.3: Focus on Collaboration, Adapted from Campbell et al. (2005, P 657)

This is a model of collaboration to attain IS and organisational strategy alignment. It depicts input from both IS and institutional parties, synergy, relationship building, knowledge transfer, building of expertise and empowerment. This, coupled with effective communication, can deliver expert collaboration, resulting in expert alignment (Campbell et al. 2005).

Pirani and Salaway (2004) also argued that institutions should look outward as well as inward in the alignment process. They observed that strategic planning was significantly improved through an in-depth look at external forces in the environment and how they might affect Higher Education. The external environment played a key role due to the factors that it brought with it. External factors included increasing globalisation and connectivity, new types of educational competition, the ever-accelerating pace of transformation, the increasing complication of the regulatory environment, rising potential for disruption, and a more volatile economic environment (Pirani and Salaway 2004). It is important to understand these factors and the reality that they could also contribute to the motivation behind why alignment is so important in a changing world. The study conducted by Pirani and Salaway (2004) yielded very convincing key findings. Their surveys on HE institutions revealed that institutions that reflecting greater alignment reflected a sense of strong relationship between the institution and IS. According to Pirani and Salaway (2004) institutions that reported more IT alignment were institutions that:

- Published an institutional IT plan or continuously engaged in planning activities and reported changes in environmental climates.
- Recognised the IT governance process to be effectual.
- Perceived their IT strategic planning process to be successful.
- Had greater communication and involvement with critical constituents, especially executive management.
- Possessed clear documentation of objectives at the time of IT initiation approval.

#### **2.2.4 Academic Computing**

Academic Computing is a term used to describe the use or integration of IT/IS in the area of teaching and learning. Albright and Nworie (2008) asserted that teaching and learning were central to the mission and goals of every university and college. Teaching and learning were the two most important traditional functions of educational institutions (Nguyen 2009). Mokhtar (2005) noted that Academic Computing was the utilisation of academic staff, IT infrastructure, services (technology/information content) and students, which enabled the management and delivery of academic programmes in teaching, learning and research. This included educational technologies and applications, as well as infrastructure and services that

support research. Mokhtar et al. (2007) affirmed that the use of ICT in Academic Computing was crucial as it enhanced the teaching and learning process, facilitated constant learning and enabled borderless education. Haddad (2003) noted that the emergence of IT facilitated the information age and was swiftly changing how teaching and learning are conducted. Innovative ways of using technology were enabling and enhancing teaching and learning in Higher Education throughout the world.

According to Mokhtar (2005), Academic Computing comprised infrastructure, teaching and learning, plans and policies, research and publications, information services and institutional support. Academic Computing also included some aspects of research in terms of faster processing of research data with higher accuracy and simulated complex research systems (National Science Foundation, 2003). The literature on Academic Computing showed that it is of great importance, especially in first-world countries. This was supported by Braddlee and Matthews-DeNatale (2006), who concluded that Academic Computing held high promise for improving Higher Education. They observed that there was a movement away from how much technology was being used towards how well Academic Computing was being used to improve student learning. Academia and research are the crux of Higher Education and hence Academic Computing was a vital component. Academic Computing was viewed as a technological enabler of academia (UCT ICT Director 2011).

### **2.2.5 IS Strategy and its impact on Academic Computing**

As previously discussed, Academic Computing can be viewed as the use of technology in academia. With reference to a first-world academic institution, Portland College, USA, it was shown that technology infused all aspects of this college and continued to be fundamental to the success of the institution. The application and use of technology impacted directly on the classroom and support areas (Ahmed et al. 2007). The College understood the importance of effective Academic Computing and also acknowledged that technology would continue at a break-neck speed. Ahmed et al. (2007) noted that Portland Community College was committed to keeping pace with technological change in order to remain current. Their aim in the use of technology was to be innovative and responsive to College needs. The College focused a significant proportion of its technological tools and IS on Academic Computing.

Another remarkable example of IS strategy in Academic Computing was provided by the Economics Intelligence Unit (2008), which noted that a United States “top wired” university, the University of Illinois at Urbana Champaign had taken a tremendous step forward in Academic Computing through IS. In January 2008 the University launched the University of Illinois Global Campus, an integrated online programme created in collaboration with the academic departments. The ability to offer greater access to educational opportunities was the primary catalyst.

Johnson from the University of Illinois acknowledged that there were many people who desired certification or degree programmes, but could not attend campus-based programmes. These included single mothers, working professionals and non-traditional students. The University saw e-Learning as a vital tool in making this possible. It was achieved by aligning the institutional strategy and the IS strategy and using it to enhance IS. In simple terms, there was a need to serve distance-learning candidates who wanted an opportunity to study. IS bridged the gap (Economics Intelligence Unit 2008). There was alignment of the two entities, focusing on an organisational milestone of enhancing Academic Computing to achieve distance learning (Economics Intelligence Unit 2008). Campbell and Oblinger (2007) asserted that technology and its use in teaching; learning and research had become an integral part of the Higher Education setting. Further innovation and research on the use of technology to enhance teaching and learning were underway at numerous institutions. Both educators and students acknowledged the value of what technology offered in terms of teaching and learning.

Mokhtar et al. (2007) from the Malaysia University of Technology spoke of the ICT strategy driving Malaysian Higher Education towards excellence. They discussed the use of ICT and how it supported the core areas of Higher Education, namely, teaching, learning and research. A fast developing country like South Africa needs to attain the same level of enthusiasm and move towards effective IS systems similar to its first-world counterparts. Libya, a developing country, is determined to pursue first-world innovation, IS and Academic Computing in its Higher Education institutions. Rhema and Miliszewska (2010) noted that Libya had always been eager to ensure access to appropriate education for all members of society. Adopting ICT in Higher Education was an essential part of the Libyan government’s holistic development plans. Libya sought to play a principle role in Africa (third world) by promoting major initiatives and projects, including those in the neighbouring countries of “Chad, Niger,

and Rwanda” [P 423]. This goes to show that there are developing countries that are in pursuit of the IS that is used in Higher Education in first-world countries.

### **2.2.6 Current Information Systems used in Academic Computing at the University of KwaZulu-Natal**

UKZN is a prominent university in South Africa. It boasts five large campuses across the province of KwaZulu-Natal. It is ranked within the top 500 universities of the world, and is also the largest contact learning university in South Africa. UKZN’s student population is approximately 42 000 students across the five campuses (UKZN Online, 2011). UKZN aspires to be the “Premier University of African Scholarship”. The University is committed to enhancing its IS strategy to incorporate it in every function of the institution through its Information and Communications Technology department (ICT). According to the UKZN ICT Director (2010), the current IS infrastructure is as follows, listed in order of functional importance: Telecommunications, Administration Support Systems, Academic Computing and End-User Support.

The UKZN ICT Director (2010) noted that telecommunication at UKZN focused on the connection of all staff and students through effective networking of computers, telephones, fax and all other networkable devices. Administration support systems at UKZN focused on all systems that contribute to the smooth administration of the institution, spreading across all administrative departments. Academic Computing at UKZN focused on teaching, learning and research, which are the core purpose of the University. However, this was where a significant lack of IS strategy was noted. Finally, user-support at UKZN was directed towards effective and efficient systems that affect all computer users at the institution, and this ranged from desktop support to students’ local area networks (LANs) as well as staff and departmental computers (UKZN ICT Director 2010).

With regards to Academic Computing, UKZN still engaged in traditional teaching and learning practices, using standard tools like Microsoft PowerPoint presentations and whiteboard markers (UKZN ICT Director 2010). Maharaj (2010) noted that academics were still teaching the way they did 100 years ago. This related to the noticeable lack of effective Academic Computer technology such as podcasting. At present, only the Department of Information Systems and Technology, situated on UKZN’s Westville campus seems to be

making significant use of Podcasting. Meng (2005, p. 1, cited in Fernandez et al. 2009) defined podcasting as the process of capturing an auditory event and then uploading that audio file which becomes a digital format onto a website (or blog). These files can then be downloaded from the relevant webpage on their computers or storage devices. Podcasting provided students with an added dimension with which to engage with learning material. Podcasting technology allows a student to become an active participant in creating learning content and not just a passive absorber of lecture material (Maharaj 2010).

The only Academic Computing IS system that is highly prevalent at UKZN is a system called Moodle (UKZN ICT Director 2010). This system focuses on the storage of electronic lecture notes and assignments. It personalises students' modules once they have registered on it and also has the facility to send instant messages from lecturer to student or student to student. This demonstrates a need for more effective IS systems in the Academic Computing component.

Mokhtar (2005) highlighted the importance of IT/IS components in teaching, learning and research. He noted that IT was used in various ways to support teaching, learning and research, including using the Internet for research and specialised lecture-based software. IT supported traditional classroom tools such as the use of presentation software. It was also used in conjunction with conventional learning and traditional lecture styles, including computer modelling and multimedia courseware. IT was used for flexible learning such as e-Learning, and self-paced and remote-location learning. Finally, IT was used in electronic communication and collaboration among students and lecturers for teaching, learning and research purposes such as e-mail, forums, discussion groups and peer advice (Mokhtar 2005).

Mokhtar et al. (2007) conducted a study in 2007, where they set out to evaluate the characteristics, benefits and performance of effective IS in Academic Computing. They were of the view that that the primary activities of teaching and learning and research combined with the use of IT/IS was a key factor in delivering core Higher Education. They depicted this in the form of a framework, which categorised ICT support activities into four main areas, namely: IT vision, plan, policies and standards, ICT infrastructure, information services and institutional ICT support. The starting point was the ICT vision, which again ties back to alignment. This was given first priority, as the role of the ICT vision, plan, policies and standards was crucial because of the long and costly process of implementing Academic



Computing (Mokhtar et al. 2007). The starting point should be to get the basic issues of vision alignment, plans and policies right. Proper vision and plans can only come about if there is proper collaboration between ICT and the institution itself. The institution should represent the aspect of teaching; learning and research, while ICT should represent the technology and IS that could be incorporated to improve Academic Computing. Once this alignment is forged, overall IS and IS in Academic Computing divisions could be accomplished. The objective of improving the quality of education takes into account the appropriate level of new technology to assist the process (Milliken and Barnes 2002).

Effective IS should complement and enhance good teaching and learning practices across Higher Education. Students interviewed for Fernandez et al. (2009)'s study on podcasting revealed that podcasting increased their levels of motivation in two ways. Firstly, students noticed that the podcasts were not fixed and pre-established material, as teachers changed the characteristics and the contents of the podcasts according to the comments and suggestions that students made during the course. Secondly, the teacher's voice gave them more of a feeling of proximity than other materials. This enhanced the feeling of contact between students and teachers, as well as of the teacher's concerns regarding students' needs. Podcasting allowed for the movement of the roles of traditional lectures to distance courses, which had previously been forgotten or disregarded. This demonstrates that just one aspect of IS (podcasting) in Academic Computing can make a considerable and positive difference.

The potential of what a good IS strategy could deliver to UKZN and other Higher Education institutions in South Africa needs to be established. According to the Economics Intelligence Unit (2008), technological advancement, which has been a hallmark of academic research, had the potential to change the very process of teaching and learning at educational institutions. This would enhance academic institutions' ability to equip graduates to compete in today's knowledge economy. Some of the benefits included distance education, sophisticated learning and management systems and opportunities to collaborate with research partners around the world (Economics Intelligence Unit 2008).

Currently, many first-world countries are making exceptional use of Academic Computing. In America, the United Kingdom and Europe, an IS strategy is a routine practice rather than a task (Rhema and Miliszewska 2010). It needs to be established if South Africa is following the same path as first-world countries. As noted earlier, there is currently not much research

on the alignment of IS and institutional strategy and its impact on Academic Computing in South Africa. This was the motivation for the current study and for making the study a countrywide one, which obtained input from 22 different nationally recognised Higher Education institutions in order to fulfil the objectives and answer the research questions.

### **2.3 IS Model used**

This study revolved around Schein's Organisational Culture Theory model (1988). This model is a well recognised IS model and is available at the York University site that catalogues theories used in Information Systems research (York University online, 2011). A list of studies in the IS domain that use this model is provided on this website; particularly noteworthy are a study conducted by Bradley, Pridmore and Byrd (2006), that dealt with IS success in different corporate cultures and a study by Iivari and Huisman (2007) that discussed the relationship between organisational culture and systems development methodologies. The use of the modelling of the above studies and its application to this study will be further explained in chapter five of this dissertation. The above authors believed that organisational culture played a pivotal role in the acceptance of IS and technological change in any organisation. This related well to the alignment of IS strategy with institutional strategy, whereby a culture match between both the IS department and institution are important properties on which alignment is based.

According to Schein (2004), culture was an abstraction, but the forces that were created in organisational situations that were derived from culture were powerful. If we didn't understand the operation of these forces then we would become a victim of them. A study conducted by Park et al (2004) related to organisational culture and knowledge management technology, found that the success of knowledge management technology was mediated by organisational culture and that positive culture had a positive correlation with the success of knowledge management technology implementation. According to Serrat (2009), organisational culture is said to be strong when employees respond to stimuli because of their alignment to organisational values and objectives. Conversely, there is a weak culture where there is little alignment with organisational values and control is exercised via extensive procedures and bureaucracy. This indicates that where organisational culture is strong, there is effective alignment of the organisation's people with the organisational goals. This can be between inter-departmental staff or between two separate entities like the IS department or

Information and Communication Technology division (ICT) and the institution, which is what this study focuses on. According to Boisnier and Chatman (2002), a strong culture provided organisations with significant advantages, and organisations that fostered strong cultures had clear values that gave employees a reason to embrace the culture. Some of the benefits of having a strong organisational culture included better alignment of the company towards achieving its vision, mission and goals and improved cohesiveness among the various departments and divisions. Furthermore, overall organisational efficiency was an added benefit.

In this study, Schein’s model was used to assess if a stronger organisational culture resulted in higher synergy and cohesion between the ICT department and the institution and in turn resulted in stronger alignment between IS and institutional strategy. The institutions that were selected for the in-depth analyses were the ones that were assessed by this model. The aim was to establish the motivation behind their strong alignment and whether strong organisational culture played a role in a strong alignment between IS and institutional strategies.

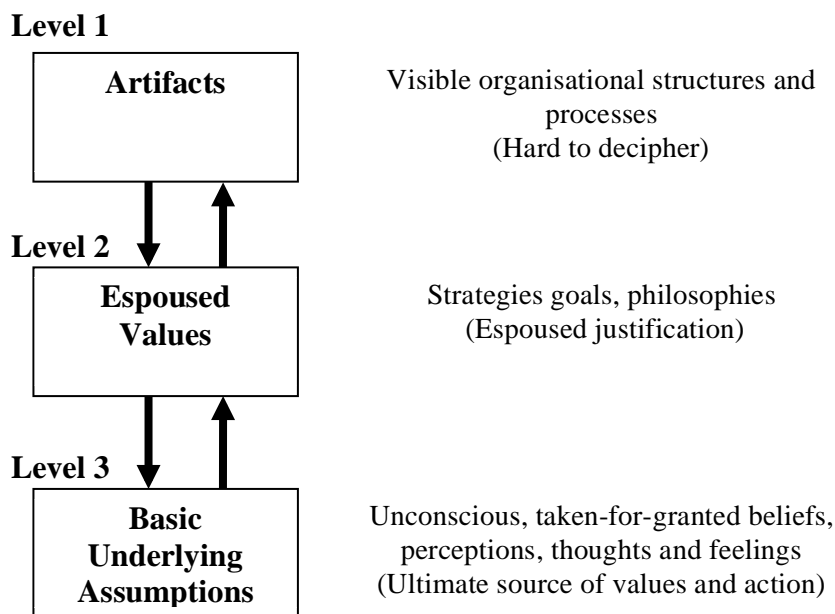


Figure 2.4- Schein’s Organizational Culture theory model,

Source: Schein EH (1992)

According to Schein (1988), Artifacts (level 1) were difficult to measure (hard to decipher) and they dealt with organisational attributes that could be noticeably observed. Technology

was one of the main attributes at this level (Schein 1992). Values (level 2) dealt with the espoused goals, ideals and objectives of the organisation and the justification behind those goals and objectives. Underlying assumptions (level 3) dealt with perceptions and beliefs that were concretised and taken for granted and were not really recognised. This was the source of the values, motives and actions that caused an organisation to be inclined to the way it operated or functioned (Schein 1988). This study will apply this model to the organisational culture of the selected institutions and their respective ICT departments.

## **2.4 Summary**

This chapter provided a review of the literature that supports this study. IT, IS, Academic Computing, alignment and IS strategy were defined. The importance of IS alignment was shown from a business perspective, along with the benefits of the alignment of IS and institutional strategy. It was noted that the alignment of IS and institutional strategy could be related to almost any institution. The alignment of IS and institutional strategy in Higher Education was then explored. Examples of the benefits of the alignment of IS strategy in Higher Education in first-world countries were outlined. The current IS in Academic Computing at UKZN was discussed. Deficiencies were highlighted in the area of Academic Computing. The need for alignment in Higher Education was addressed. IS strategy and its association with Academic Computing was explained in detail. The IS model that is used and applied in this study was depicted. The following chapter discusses the methodology, the aims of this study, information on the study participants, and the data collection strategy, as well as the research design.

## **CHAPTER THREE**

### **Research Methodology**

#### **3.1 Introduction**

A good method is one of the key factors in conducting structured research that results in minimum bias. It is therefore critical to choose the correct method to solve a problem (Buckley 2007). The role of this study's research method will be to provide an objective, structured and standardised approach to conducting research. This chapter will highlight the aims and objectives of the study. Recruitment of participants for the study will be discussed. This chapter will also detail the research design and data collection strategies. Questionnaires and interviews will be used as the instruments to carry out the research. The methods for data analysis will also be discussed in this chapter. This study will incorporate both qualitative and quantitative methods.

#### **3.2 Aim and Objectives of the Study**

The aim of this study is to determine the degree of alignment between IS strategy and institutional strategy and the impact of this relationship on the Academic Computing divisions within Higher Education.

The Primary Objectives are:

- To determine the link between the IS vision and mission and the institutional vision and mission.
- To determine the effectiveness of the current IS strategy in the area of Academic Computing.
- To critically evaluate the current IS strategy vis-à-vis the institutional strategy by soliciting the opinions of IS personnel from selected Higher Education institutions in South Africa.

### **3.3 Participants and Location of the Study**

This study has been conducted in universities within South Africa. The participants comprised IT/IS directors, CIOs, or IT/IS managers at the 22 nationally recognised universities in South Africa:

- Cape Peninsula University of Technology
- Central University of Technology
- Durban University of Technology
- Nelson Mandela Metropolitan University
- North West University
- Rhodes University
- Stellenbosch University
- Tshwane University of Technology
- University of Cape Town
- University of Fort Hare
- University of the Free State
- University of Johannesburg
- University of KwaZulu-Natal
- University of Limpopo
- University of Pretoria
- University of South Africa
- University of Venda
- University of the Western Cape
- University of the Witwatersrand
- University of Zululand
- Vaal University of Technology
- Walter Sisulu University

The departmental heads of the IT/IS or ICT discipline of these universities were chosen as the participants in this study. They were chosen due to the fact that strategic alignment occurs at the top of any organisation or institution. The fundamental ideas are generated at the top line of management, which is also complemented by executive decisions in most institutions. Strategies stem from ideas and decisions, and strategy and alignment emanate from the

decision makers who are the top management of an organisation. Strategy and changes made filter through from senior management down to the lower levels of the institution or organisation. This study will assess responses from senior level management as an accurate indicator of the objective of this study. The research will be conducted from Durban, South Africa and communication with all participants will be via email, telephone and electronic questionnaires administered to the relevant participants who are based at the various universities around South Africa.

### **3.4 Data Collection Strategies**

Data for this study was from two data sources: group 1 and group 2. Group 1 data (responses of the 22 participants) were collected from the questionnaires. The questionnaire was designed using Questionpro<sup>®</sup> and distributed to the participants via email. The feedback from each participant was recorded and stored on Questionpro<sup>®</sup>. This programme collates data and can compile various reports for any analysis required. The data can be exported to other compatible programmes, for example Microsoft Excel and it can be analysed thereafter.

Group 2 consisted of qualitative data collected from the two institutions that were selected for the in-depth qualitative analysis. This in-depth analysis took the form of detailed interviews with the University of Cape Town (UCT) and the University of Pretoria (UP). The interviews were telephonic and the screening process for these interviews involved critical analysis of the vision and mission statements of the ICT departmental website of these institutions. Data for the interviews were transcribed and analysed qualitatively. The interview protocol is attached as appendix 4.

### **3.5 Research Design and Methods**

#### **3.5.1 Description and Purpose**

This study had a total targeted population of 22 IT/IS directors across all the chosen universities. Each participant signed a consent form and all study related information regarding participants' information was kept confidential. Two groups formed part of the study participant cohort. The first group were part of the quantitative analysis (questionnaires) and the second group constituted the qualitative analysis (interviews).

Following consent from each prospective participant, questionnaires were sent to the first group.

For the group 2 interviews, a meticulous analysis of the vision and mission statements on the ICT departmental website of these institutions was undertaken. Once all 22 mission and vision statements were analysed, the ones showing clear alignment between IS and institutional strategy were targeted. Even though there were more than three that reflected this, the three chosen were more descriptive regarding their role and alignment with the institution as a whole. However, only two out of the three were conducted due to unavailability of the third participant (University of the Western Cape). The interviews were carried out and both interviews were transcribed, totalling 17 pages on Microsoft Word.

For the quantitative data, the Questionpro® questionnaires consisted of:

- Demographic information, such as gender, age group etc.
- Twenty-eight questions based primarily on alignment of IS Strategy with Institutional Strategy.
- A Likert scale of 1 to 5 was used based on agreement with statements made on the questionnaire.

The questions for the interviews were designed for institutions that had a strong existing alignment of IS and institutional strategy. The interviews were conducted telephonically, which facilitated the process. The interview comprised of eight questions focusing purely on strong existing alignment and the motivation behind it. The objectives of the interview were:

- To establish the motivation/attitude behind what makes this institution possess such an effective IS strategy.
- To determine the processes involved in developing a powerful IS strategy.
- To learn more about the systems used in the Academic Computing component at this institution.
- To identify synergy in the relationship between the ICT department and the academic side of the institution.



### **3.5.1.1 Construction of the instrument**

#### **Questionpro<sup>®</sup> Overview**

Questionpro<sup>®</sup> is a powerful online survey/questionnaire design tool available from the Questionpro website. The survey can be administered in five different ways. This can be via a survey link, email, social media (Twitter, Facebook and LinkedIn), website intercept (web pop-up) or even through the MicroPanel network. Questionpro<sup>®</sup> allows one to track respondents and gives real-time response rates and reports. Reports generated can be in various forms such as real time summary, participant statistics and open-ended text. Data analysis is also made simple and efficient with tools such as cross tabulation, data segmentation, trend analysis, TURF analysis, and customized analyses and as of late, word cloud analyses. Exporting of data to the various MS office packages is also possible with great simplicity. The questions were approved by UKZN's Ethics Committee.

### **3.5.1.2 Recruitment of the study participants**

The population of this study was the 22 IT/IS directors at the 22 public universities in South Africa. This constituted the population as there is usually only one ICT director per university. The quality of the data is of a high standard because the participants were the main players in the departmental strategic decision-making, thereby influencing any strategy changes in these Higher Education institutions. Most of the respondents agreed to participate, while some were reluctant and one refused at the outset. The informed consent form was sent first in order to ensure that ethical permission was obtained from these participants. Once permission was obtained, the questionnaire was administered. The interviews with the three respondents from three different universities came next. These respondents were considered on the basis that their organisations reflected strong alignment of IS and institutional strategy. However, only two out of the three respondents were interviewed.

### **3.5.2 Pretesting and Validation**

The two methods of interviews and questionnaires were used for data collection to ensure reliability and validity. Reliability can be defined as the consistency and dependability of the measure (Data Analysis Australia 2009). Reliability also indicates the extent to which a lack of bias exists (Sekaran and Bougie 2010). This can be vital if the measure is to be used on an

on-going basis to detect change. There are several forms of reliability, these includes: Test-retest reliability – this indicates that if the test/questionnaire were to be repeated under the same conditions, the same results would be produced; and reliability within a scale – this indicates that all the questions designed to measure a particular trait are definitely measuring that same trait (Data Analysis Australia 2009). Validity can be defined as the confirmation that what one is measuring is what one intended to measure (Sekaran and Bougie 2010). There are a number of types of validity including, Face Validity; whether, at face value, the questions appear to be measuring the construct. This is often seen as a rational assessment but also relies on people’s responses to survey questions. Content Validity tests whether all significant aspects of the construct are covered. Clear definitions of the construct and its components are used. Criterion Validity/Predictive Validity is used to indicate whether scores on the questionnaire effectively predict an exact measure (Data Analysis Australia 2009).

For this study, 28 questions were designed with the intention of fulfilling the objectives of the study and contributing towards answering the research questions of the study. To ensure validity and reliability of the questionnaire:

- The questions were directed purely towards the objectives and research questions.
- Some questions that were asked initially appeared later in different wording to ensure that the initial questions were being answered correctly.
- Likert scaling was used with most of the questions.
- Some questions used forced-Likert scaling to reduce neutral type answers.

The interview consisted of eight key questions. These questions were open-ended and allowed the participants to freely answer the questions. These were backed by follow-up questions in order to ensure reliability and validity. Furthermore these answers were then critically analysed by the researcher to ensure that only relevant data and data pertaining to the objectives of the study were obtained.

### **3.5.3 Administration of the Questionnaire**

The questionnaire was administered using Questionpro<sup>®</sup>'s distribution tool which enabled it to be sent to each participants via email. The questionnaire was then tracked from time to time to see how much progress each participant was making. Three reminders were sent out

to all participants who did not complete the survey before the responses were collected and analysed.

### **3.6 Analysis of the Data**

For the quantitative data, descriptive statistics were used for the analysis. This was achieved using the information gathered from respondents and collated using Questionpro<sup>®</sup>. The data for each question were imported into MS Excel 2010. This is presented in the form of graphs in chapter four. The qualitative analyses involved significant analysis of the vision and mission statements on the ICT departmental website of the institutions, supported by a critical examination of the responses to each question from the interviewees along with the analysis. The responses were examined in relation to the questionnaires in order to fulfil the objectives of the study. This was then presented in a detailed qualitative report (see chapter five).

### **3.7 Summary**

This chapter outlined the research methodology that was used in this study. A total of 22 participants who were IT/IS directors, CIOs or IT/IS managers of these institutions were selected. The construction of the instrument as well as the recruitment of the study participants were discussed in this chapter. The data collection strategy used in this study was surveys and interviews that were conducted with 22 recognised universities in South Africa. Survey software was used to conduct the questionnaires. Further interviews were conducted with two selected universities that reflected strong alignment of IS and institutional strategy. The survey and interview were designed with the aim of meeting the study objectives. Proper reliability and validity of the surveys and questionnaires were highlighted. The results will be gathered using research methods and collated in the next chapter. Results will be analysed and interpreted in chapter four. These results will be used to fulfil the objectives and research questions of the study.

## CHAPTER FOUR

### Presentation of Results

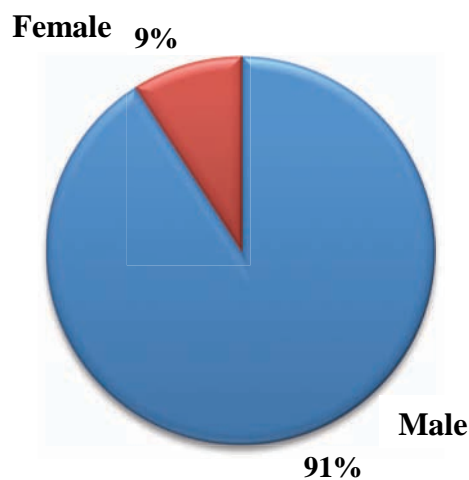
#### 4.1 Introduction

This chapter will involve the analysis of the results of the study for the surveys (quantitative) and the interviews (qualitative) that were conducted. There were originally 22 participants, one from each of the 22 different universities that were targeted. A total of 21 questionnaires were distributed (as one prospective participant declined to participate), and a response of 52% was obtained. The quantitative data that will be gathered in this chapter is pertinent, such as institutional and IS strategy alignment related questions and questions relating to IS strategy in Academic Computing. This chapter will also provide a detailed analysis and presentation of the qualitative data (interviews) of the two institutions that were selected for the in-depth analysis, from which meaningful results were extracted.

#### 4.2 Section A: Demographics

##### 4.2.1 Gender

Demographic data collected showed that 91% of the respondents (n=10) were male and 9% were female (n=1).



**Figure 4.1:** The proportion of male and female respondents

### 4.2.2 Age

The age range of the respondents showed that none were in the age group <21 years, none were in the age group 21-30 years, 9% were in the 31-40 year age group (n=1), 18% in the age group 41-50 (n=2) and 73% were >50 years old (n=8).

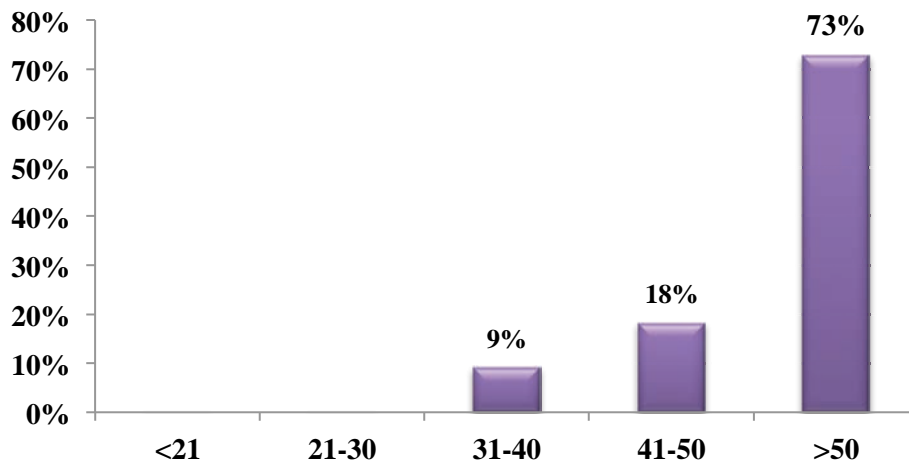


Figure 4.2: Age of Respondents

## 4.3 Section B: Current Occupation

### 4.3.1 Period of employment at the University

Data from this section revealed that 55% of the respondents were employed at the university for up to four years (n=6), none were employed between five and eight years, 9% were employed between nine and 12 years (n=1) and 36% were employed >12 years (n=4).

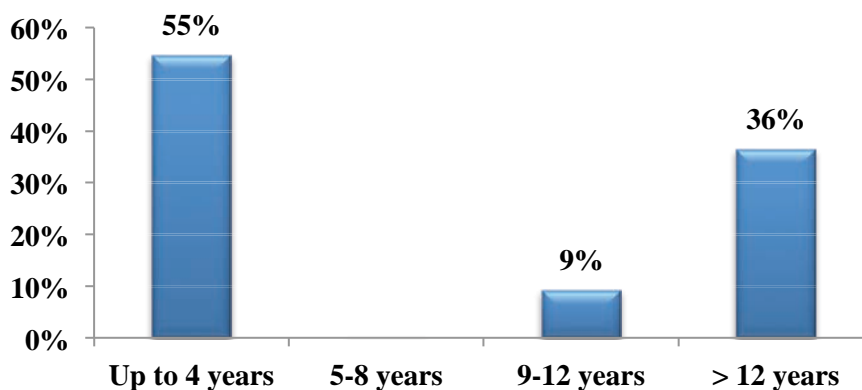


Figure 4.3: Period of employment of participants at the institution

### 4.3.2 Job titles

The respondents were asked to supply their current job titles at the institution of employment. The responses showed 18% (n=2) were Chief Information Officers (CIOs), 64% (n=7) were ICT directors and 18% (n=2) were ICT managers.

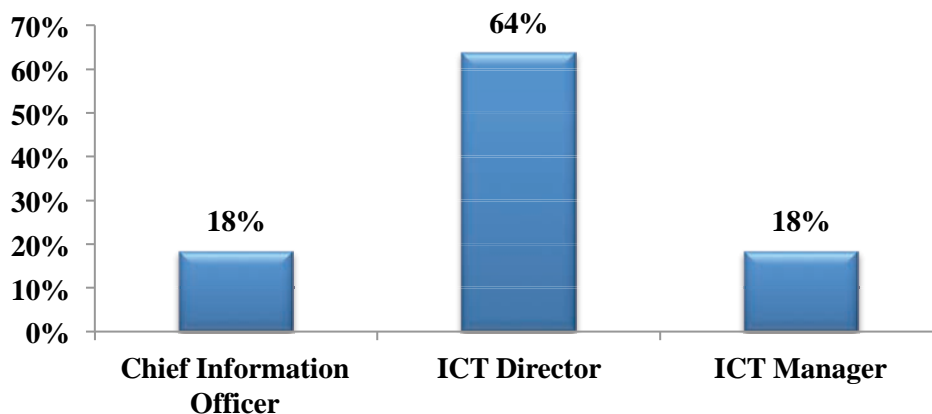


Figure 4.4: Job titles

### 4.3.3 Period of employment at current level

Data for the period of employment at current level showed that 55% were employed up to four years (n=6), none from five to eight years, 27% were employed between nine and twelve years (n=3), 9% were employed for > 12 years (n=1) and 9% did not specify (n=1).

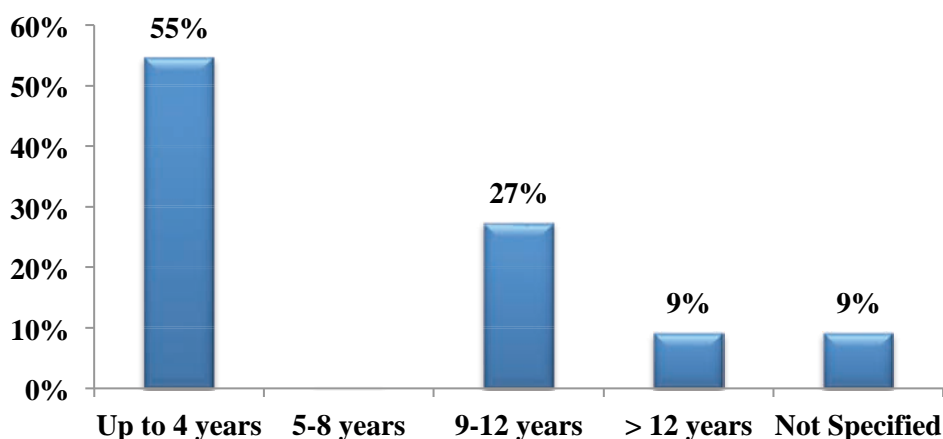


Figure 4.5: Period of employment at current job level

#### 4.3.4 Respondents' superiors

Data collected for respondent's superiors revealed that 9% reported to the institutions Deputy Vice-Chancellor (DVC) Knowledge and Information Management (n=1), 9% reported to the Chief Operations Officer (COO) (n=1), 9% to the Chief Financial Officer (CFO) (n=1), 9% to the Operations/Facilities Manager (n=1), 18% to the IT director (n=2) and 45% reported to the Deputy Vice-Chancellor (support services) (n=5).

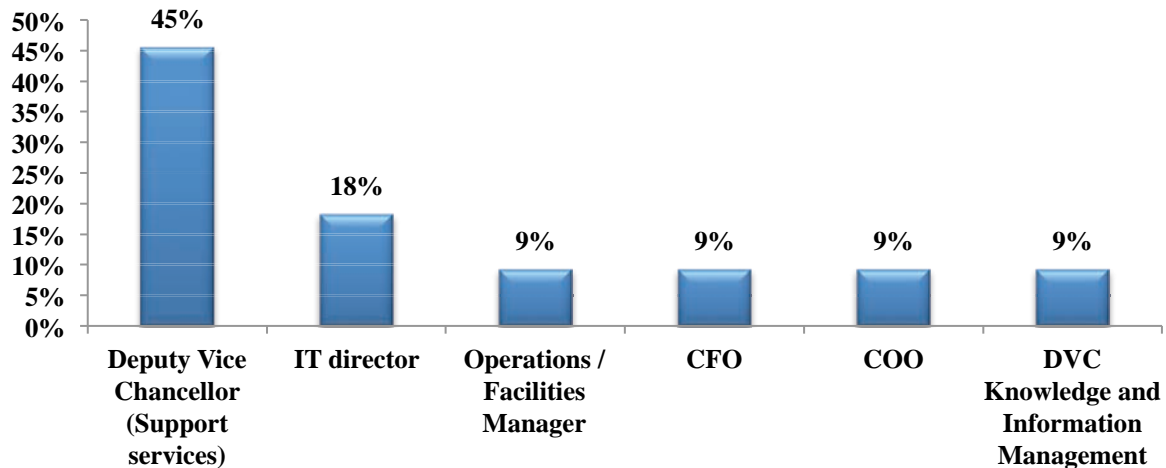


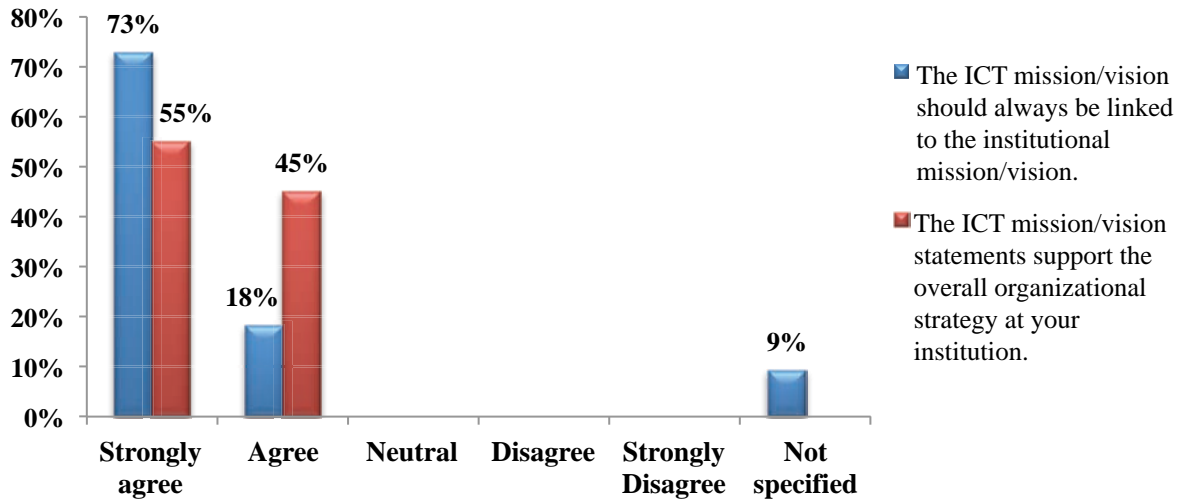
Figure 4.6: Respondents' superiors at the Institution

#### 4.4 Section C: Institutional and IS Strategy

A total of 16 structured questions were asked in this section.

- The results showed that all participants (n=11) were familiar with the mission/vision statements that existed at their institution.
- The results also showed that all participants (n=11) were familiar with the mission/vision statements that existed at their department.
- In response to the statement “The ICT mission/vision should always be linked to the institutional mission/vision” 73% (n=8) strongly agreed, 18% (n=2) agreed and 9% did not specify.
- In response to the statement “The ICT mission/vision statements supports the overall organisational strategy at the institution”, 55% of the respondents (n=6) agreed very strongly, 45% (n=5) agreed.

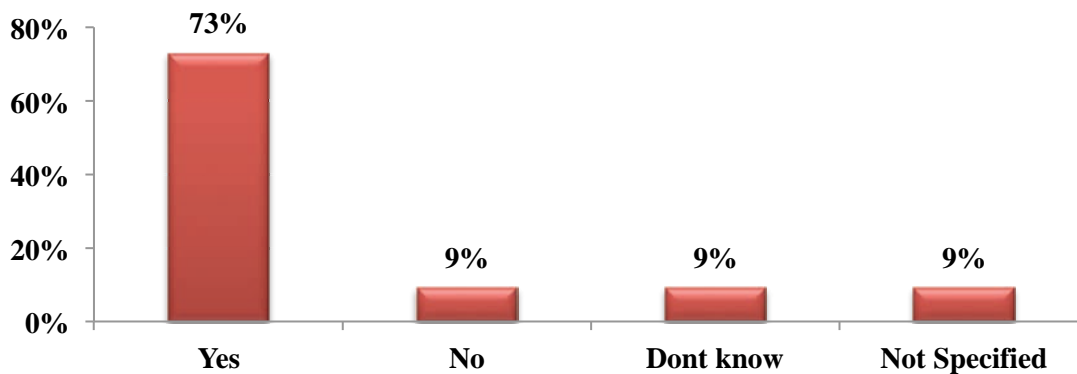
**4.4.1 Link between ICT mission/vision statements and institutional mission/vision**  
**Statements and response to the ICT mission/vision statements supporting the overall organisational strategy at the various institutions**



**Figure 4.7:** Link between ICT and institutional mission/vision and ICT mission/vision statements supporting overall strategy

**4.4.2 Evaluation of the current IS strategy vis-à-vis the institutional strategy**

The data collected on consultation with the ICT department when the institution drafted the mission/vision statements, showed that 73% of the respondents agreed that the ICT department was consulted (n=8), and 9% reported that there was no consultation (n=1), while 9% did not know (n=1) and 9% did not specify an answer (n=1).

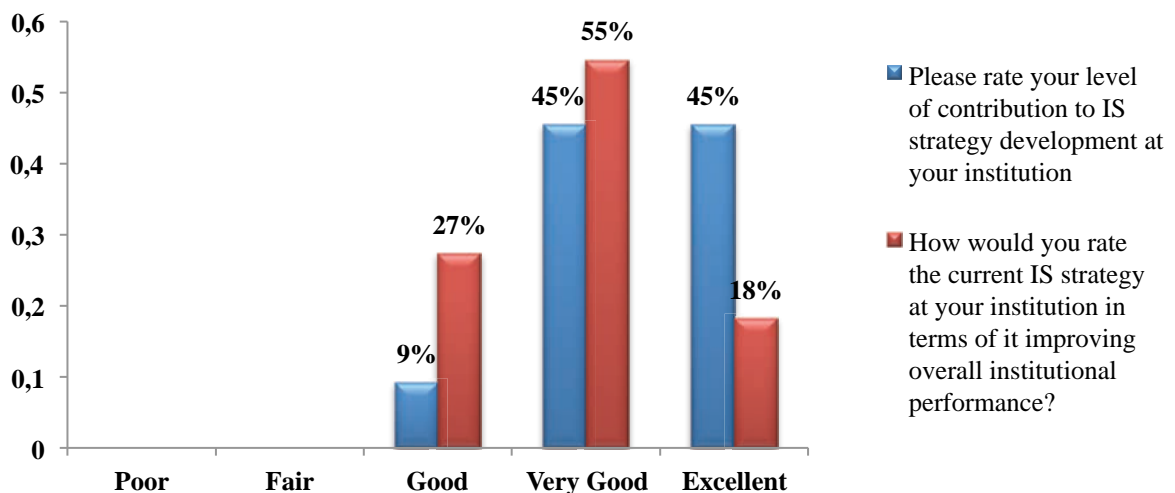


**Figure 4.8:** Consultation of ICT department when drafting institution mission/vision statements



#### 4.4.3 Level of contribution and rating of the current IS

- The level of contribution to IS strategy development at each institution was rated by each participant. These results depicted that 45% of the respondents indicated having an excellent level of contribution to IS strategy development (n=5), another 45 % indicated a very good level of contribution to IS strategy development (n=5) and 9% indicated a good level of contribution to IS strategy development (n=1), in their respective institutions.
- The current IS strategy at each institution relating to improving overall institutional performance was rated. It showed that 18% responded that they have an excellent current IS strategy at their institution (n=2), 55% described it as very good (n=6) and 27% said they have a good current IS strategy at their institution (n=3).



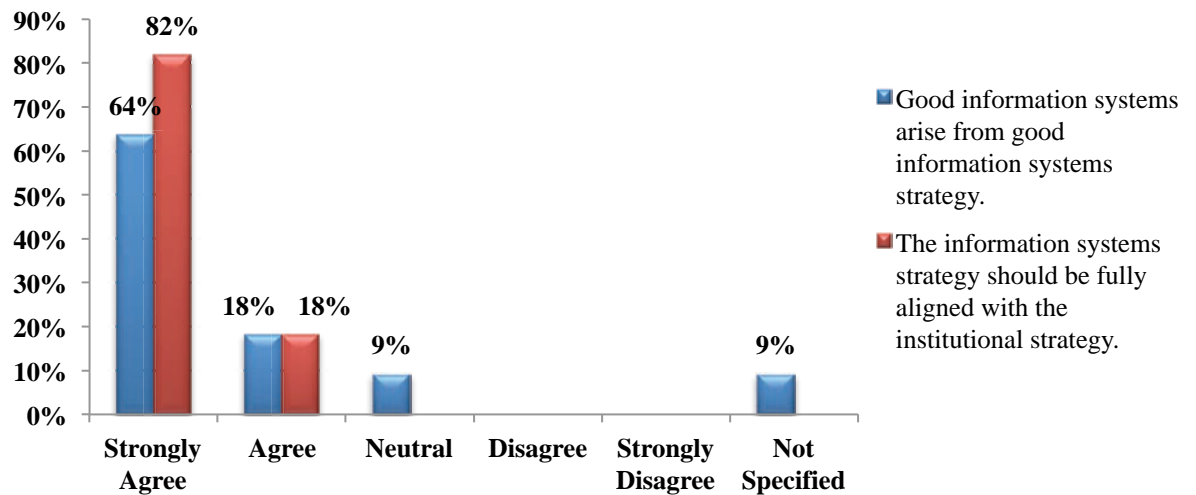
**Figure 4.9:** Level of contribution to IS strategy development and the rating of the current IS strategy for improving overall institutional performance

#### 4.4.4 Good IS arose from good IS strategy

The results showed that 64% of the respondents strongly agreed (n=7), 18% of the respondents agreed (n=2), 9% of the respondents had a neutral response (n=1) and 9% of the respondents did not specify (n=1) that good IS arose from good IS strategy.

#### 4.4.5 The IS strategy should be fully aligned with the institutional strategy

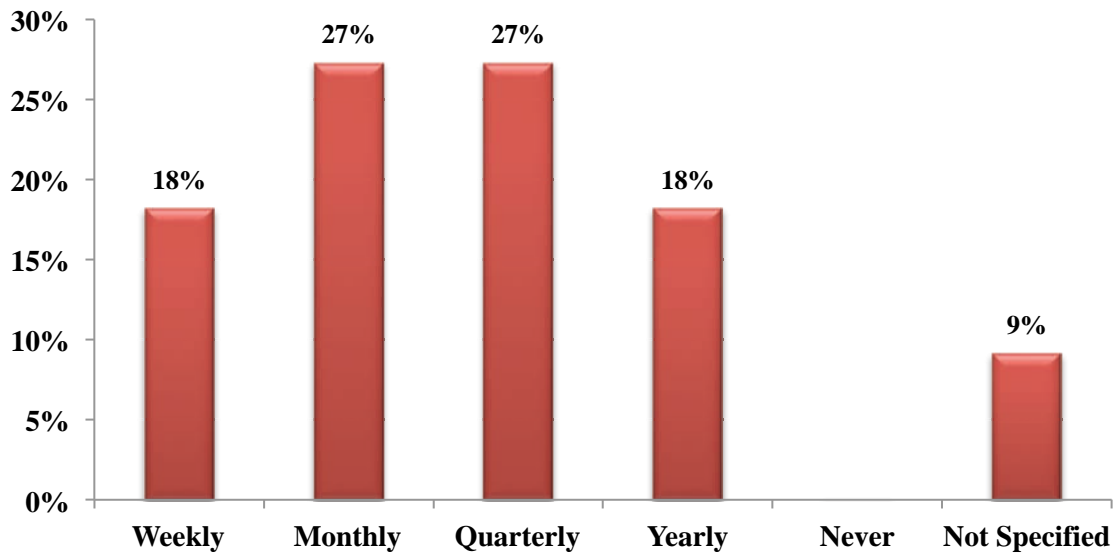
Eighty-two percent of the respondents strongly agreed (n=9), 18% of the respondents agreed (n=2), 9% had a neutral response (n=1) and 9% did not specify that the information strategy should be fully aligned with institutional strategy.



**Figure 4.10:** Does good IS arise from good IS strategy and alignment of IS and institutional strategy?

#### 4.4.6 Frequency of IS strategy meetings

Eighteen percent of the respondents (n=2) stated that IS strategy meetings were held weekly, 27% of the respondents (n=3) stated monthly, 27% of the respondents (n=3) stated quarterly, 18% of the respondents (n=2) stated yearly and 9% of the respondents (n=1) did not specify.



**Figure 4.11:** Frequency of IS strategy meetings

**4.4.7 The institution’s strategic planning department including the strategy from the ICT department when developing major institutional strategies**

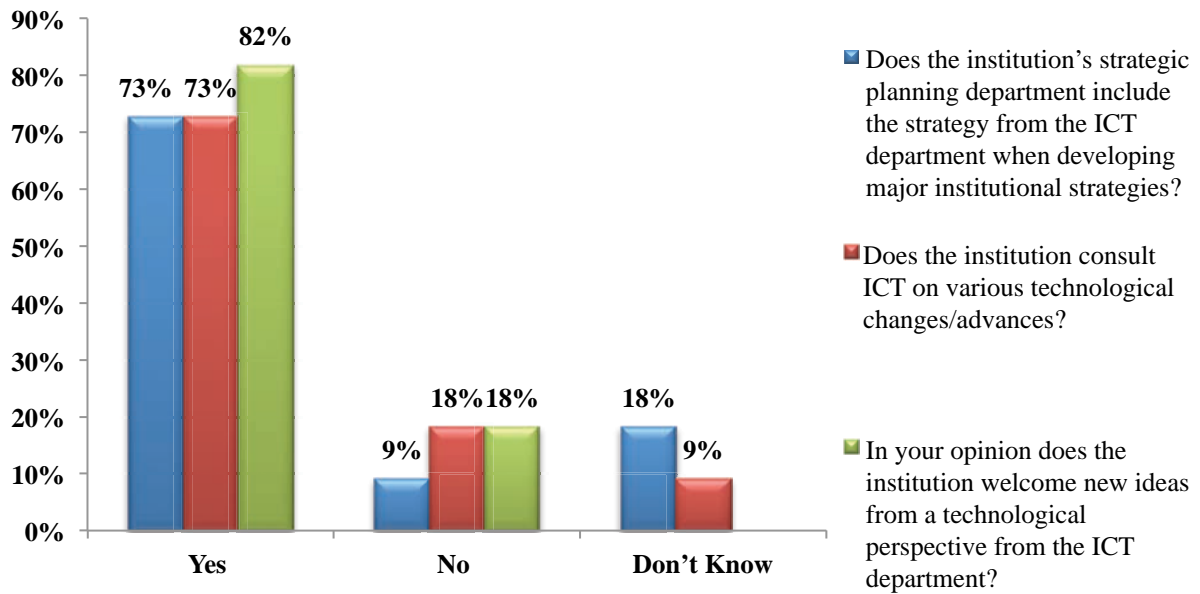
The results showed that 73% of the respondents (n=8) answered yes, 9% of the respondents (n=1) answered no and 18% of the respondents (n=2) did not know.

**4.4.8 The responses for consultation with ICT on various technological changes/advances by the institution**

The results showed that 73% of the respondents (n=8) answered yes, 18% of the respondents (n=2) answered no and 9% of the respondents of the respondents (n=1) did not know if there was consultation.

**4.4.9 Does the institution welcome new ideas from the ICT department from a technological perspective?**

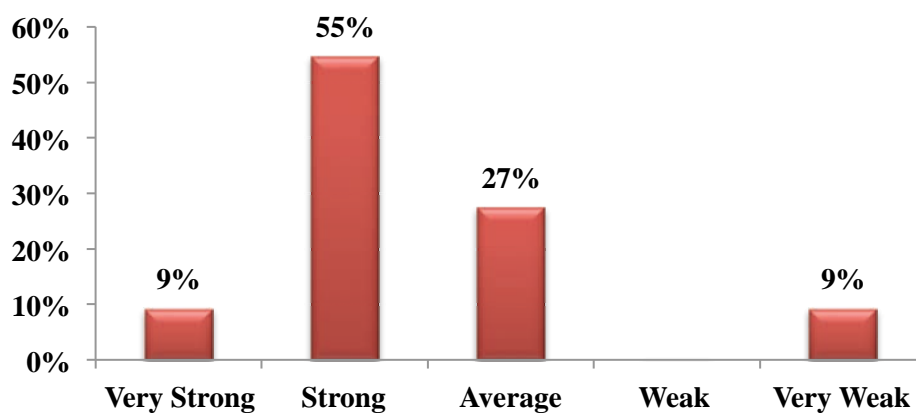
The results reflected that 82% of the respondents (n=9) answered yes and 18% of the respondents (n=2) answered no.



**Figure 4.12:** Inclusion of ICT department for institutional strategic planning

#### 4.4.10 The organisational culture between the ICT department and the Institution in respect to the alignment of IS strategy with Institutional Strategy

The results showed that 9% of the responses (n=1) chose very strong, 55% of the respondents (n=6) answered that it was strong, 27% of the respondents (n=3) answered that it was average and 9% of the respondents (n=1) answered that the organisational culture between ICT and the institution was very weak.



**Figure 4.13:** Organisational culture between the ICT department and the institution in respect to the alignment of both strategies

#### 4.5 Section D: Academic Computing

A total of nine structured questions were asked in this section.

##### 4.5.1 Knowledge of the IS used in the Academic Computing component at institutions

The results showed that 18% of the respondents (n=2) indicated having excellent knowledge of the IS used in the Academic Computing component of their institution. 55% of the respondents (n=6) had very good knowledge, 18% of the respondents (n=2) had good knowledge and 9% of the respondents (n=1) had a fair knowledge of the systems used in the Academic Computing component.

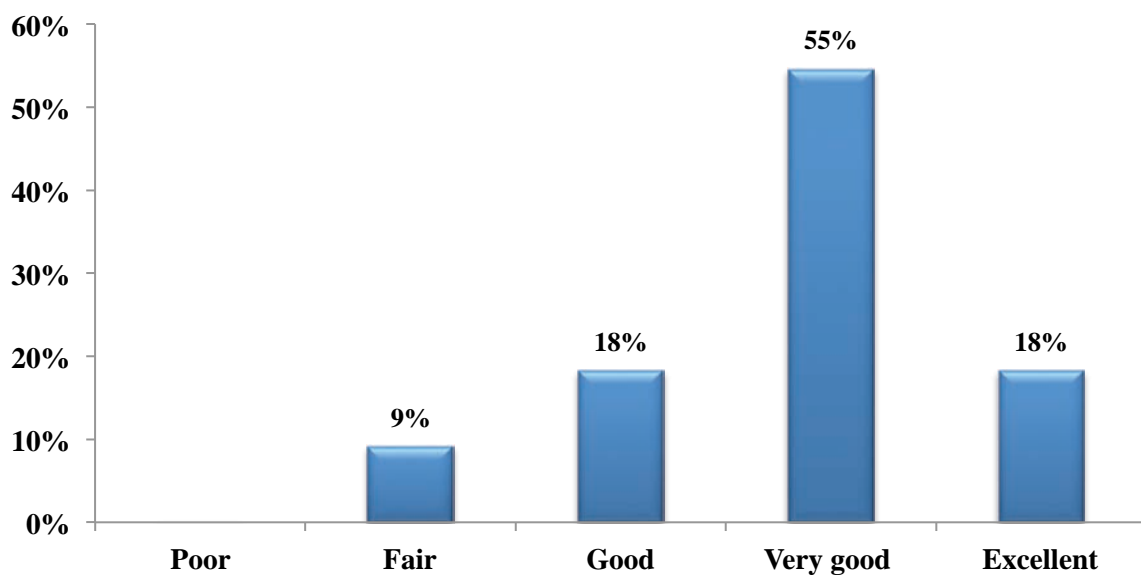
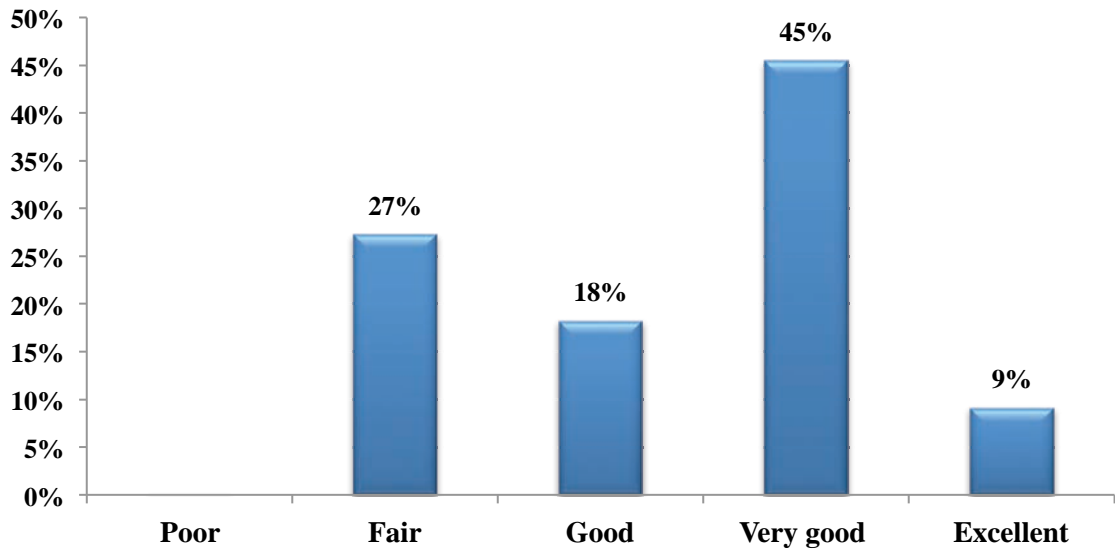


Figure 4.14: Knowledge of IS used in Academic Computing

##### 4.5.2 Effectiveness of the current IS in the Academic Computing component at institutions

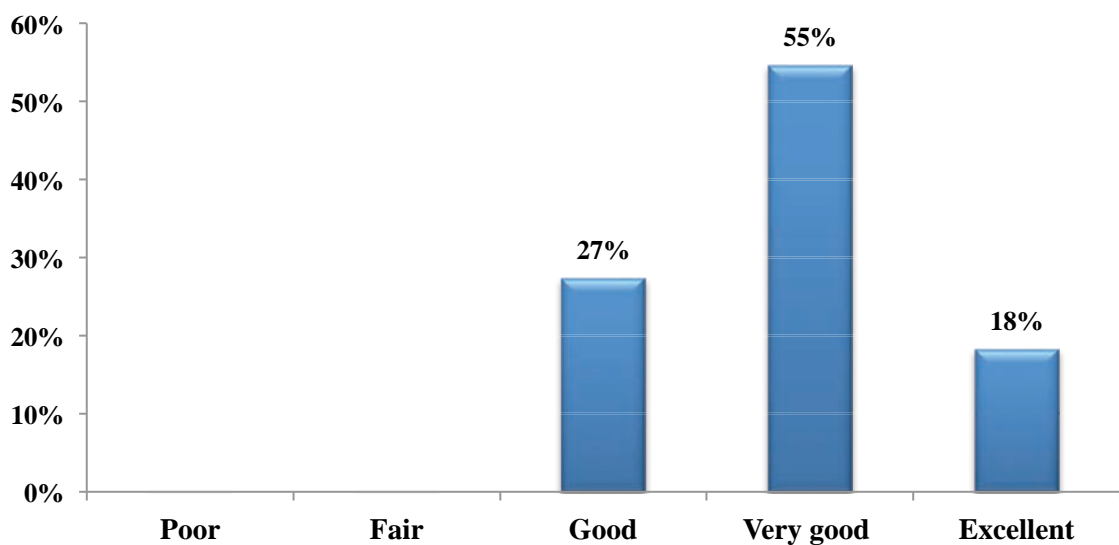
The results showed that 9% of the respondents (n=1) rated the effectiveness of the current IS in the Academic Computing component at their institution as excellent, 45% of the respondents (n=5) rated it as very good, 18% of the respondents (n=2) rated it as good and 27% (n=3) of the respondents rated it as fair.



**Figure 4.15:** Effectiveness of the current IS in the Academic Computing component

#### **4.5.3 Knowledge of Academic Computing IS used at Higher Education institutions in first-world countries**

The results showed that 18% of the respondents (n=2) had an excellent knowledge of Academic Computing IS used at Higher Education institutions in first-world countries, 55% of the respondents (n=6) had very good knowledge and 27% of the respondents (n=3) had good knowledge.



**Figure 4.16:** Knowledge of Academic Computing systems in first world countries

#### 4.5.4 Involvement of respondents in current IS in Academic Computing

The question relating to involvement with the current IS in the Academic Computing component was rated. Eighteen percent of the respondents (n=2) indicated a very high involvement, 55% of the respondents (n=6) indicated high involvement and 27% of the respondents (n=3) indicated medium involvement.

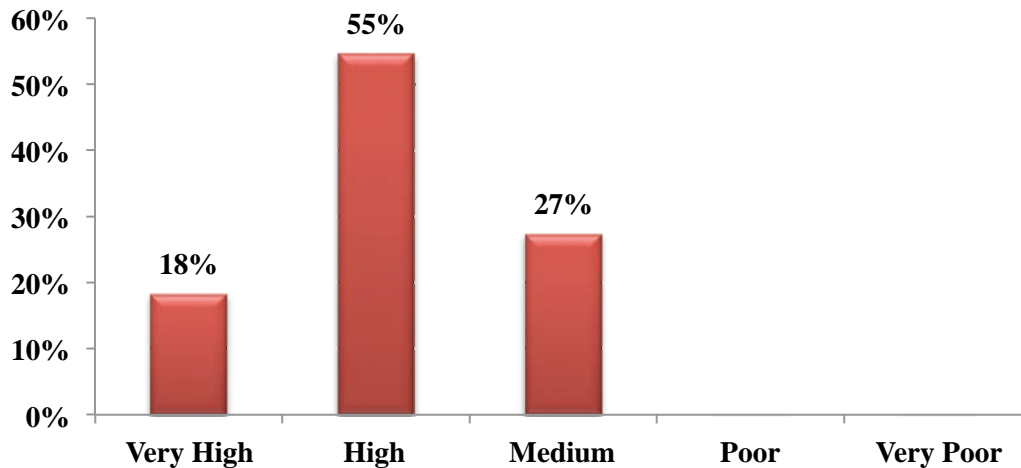


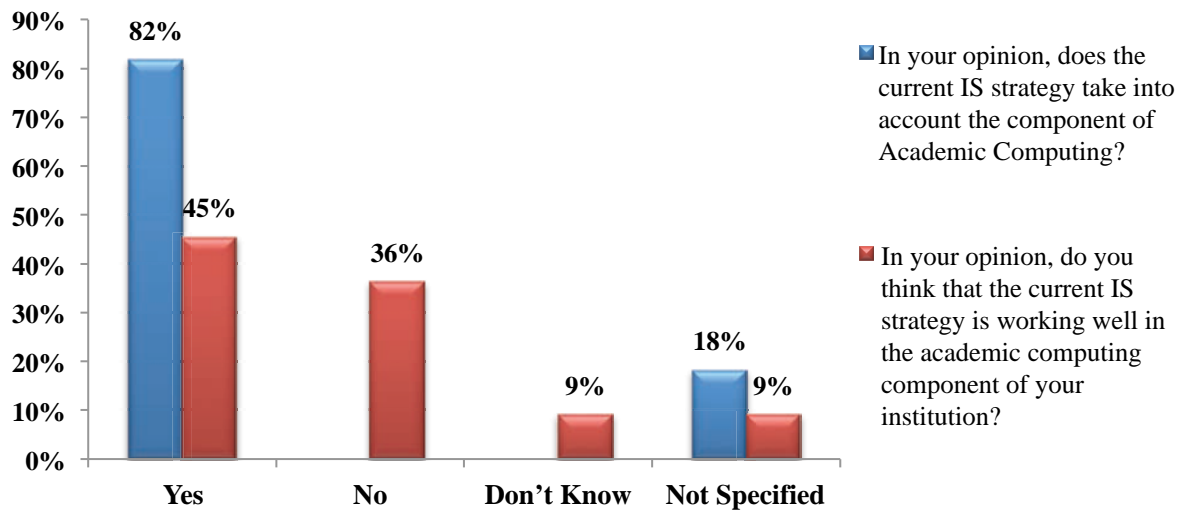
Figure 4.17: Involvement of respondents in current IS in Academic Computing

#### 4.5.5 Does the current IS strategy take into account the component of Academic Computing?

The results depicted that 82% of the respondents (n=9) answered yes and 18% of the respondents (n=2) answered no in respect of the question as to whether the current IS strategy takes into account the component of Academic Computing.

#### 4.5.6 Do you think that the current IS strategy is working well in the Academic Computing component of your institution?

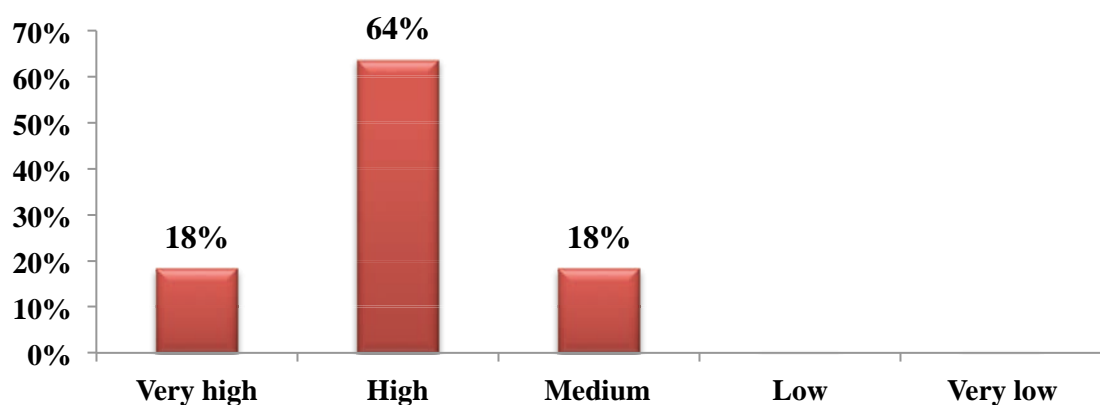
The results revealed that 45% of the respondents (n=5) answered yes, 36% of the respondents (n=3) answered “no”, 9% of the respondents (n=1) did not know and 9% of the respondents (n=1) did not specify if the current IS strategy is working well in the Academic Computing component of their institution.



**Figure 4.18:** Does current IS strategy take Academic Computing into account and effectiveness of current IS strategy in Academic Computing

#### 4.5.7 Priority of Academic Computing in current IS Strategy

The results showed that 18% of the respondents (n=2) rated the priority of Academic Computing in the current IS strategy as very high. 64% of the respondents (n=7) rated it as high and 18% of the respondents (n=2) rated it as normal.

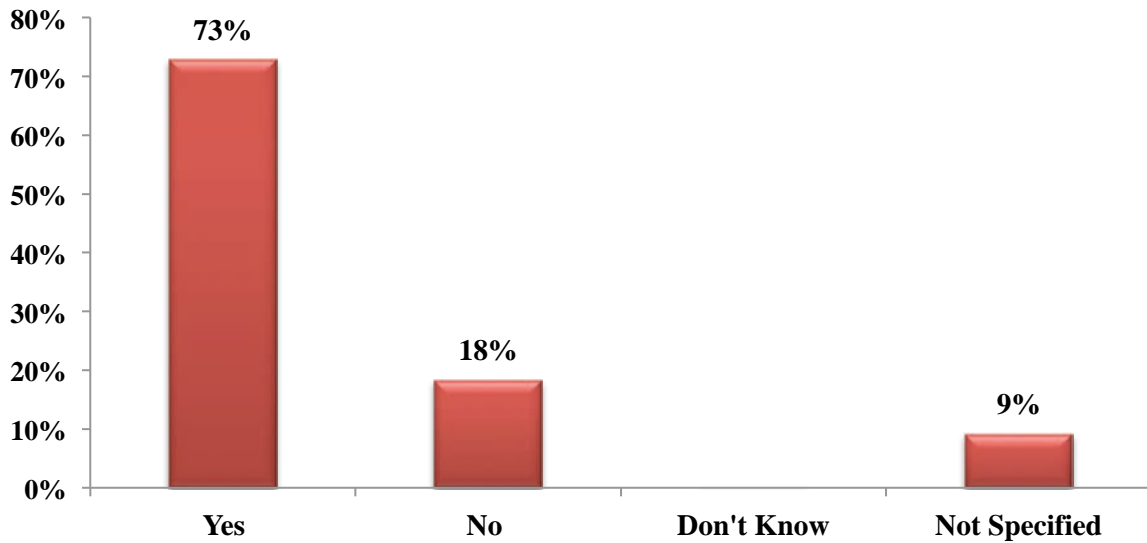


**Figure 4.19:** Priority of Academic Computing in current IS Strategy

#### 4.5.8 Need for more IS Strategy in Academic Computing

The results revealed that 73% of the respondents (n=8) answered yes to the need for more IS strategy in the Academic Computing component at their institution, 18% of the respondents (n=2) answered no and 9% of the respondents (n=1) did not specify.

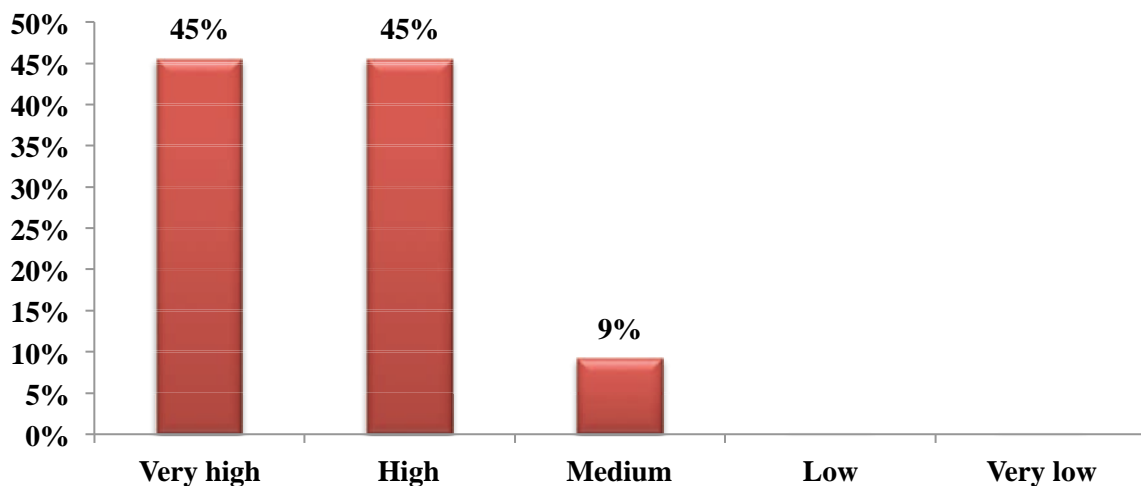




**Figure 4.20:** Need for more IS Strategy in Academic Computing

#### 4.5.9 Priority given to the development of more IS strategy in Academic Computing

The results reflected that 45% of the respondents (n=5) rated the priority of the development of more IS strategy in the Academic Computing component at their institution as very high, 45% of the respondents (n=5) rated it as high and 9% of the respondents (n=1) rated it as medium.



**Figure 4.21:** Priority given to the development of more IS strategy in Academic Computing

#### **4.6 Qualitative results (Interviews)**

The ICT directors of three universities were selected for in-depth interviews. After critical examination of the ICT vision and mission statements against the institutional vision and mission statements of the 22 different universities in South Africa, the ICT directors of three universities, namely, the University of Cape Town (UCT), University of Pretoria (UP) and University of the Western Cape (UWC), were contacted for participation in the interviews. The interview protocol is attached in appendix 4. Following interview invites and follow-up invites, the ICT directors of UCT and UP indicated their willingness to participate, however, UWC was not reachable. The ICT Directors of UCT and UP also participated from a quantitative perspective by answering the online survey questionnaire in which their answers reflected strong alignment between IS vision and mission with institutional vision and mission and ICT strategy as a whole. This provided even more of a platform to conduct interviews with the ICT directors of both these institutions.

UCT is the only university in Africa to be listed in the top 200 universities in the world. It is also reputed to be the best research university in South Africa (UCT Online 2011). The purpose of the interviews was to get first-hand knowledge and research information on these two very powerful universities in terms of IS. Topics covered in the interview included motivation, synergy, strategy, systems and the overall alignment process that governed such strong alignment between the institution and ICT department as well as its impact on Academic Computing.

##### **Interview results**

Both participants held senior positions at their universities. One was an Executive Director/CIO whilst the other was an ICT director. Both had numerous years of overall IT management experience in most areas of IT including IT strategy and planning, business development, general IT management, IT research and development, network management, Academic Computing and overall management of the overall IT infrastructure of the IT department.

## **Extent of the synergy between ICT Department and the overall institutional management**

Both universities reflected a large amount of synergy, with UCT showing the most. However the overall message gathered from both participants was that there was still room for more alignment and there could never be enough alignment. Alignment was an ongoing process that needed to be continuously monitored, adjusted and evaluated.

The ICT director of UP forged professional and personal relationships with executive management, which created a good platform to engage, put points across and create a means of collaboration. At present the executive management looked at ICT from an “in-between” perspective. ICT seemed to be caught between being a support tool and a strategic asset. IT was not seen as a total strategic asset as yet. Acceptance of IT was not uniform at executive management level and as much as there was good synergy, there was also a need for more uniformity. There seemed to be either reluctance to welcome new technologies or technology phobia that prevented IT from being utilised to its fullest. It was clear that UP was very strong at IT/IS and had innovations and systems ahead of other universities, but there was still further room for improvement as they have not yet reached their goal.

The UCT ICT director did think that his department and the institution were closely aligned, but there was room for improvement. Basically, his department tried their best to align as closely as possible to the UCT overall institutional objectives and goals. The innovative ways the UCT ICT department aligned closely to the goals of the institution are illustrated below:

### **The six key strategic goals of UCT are:**

- Internationalising UCT via an Afropolitan niche
- Transformation of UCT towards non-racialism – incorporating redress, diversity, inclusiveness and the recognition of African voices
- Working towards a desired size and shape for UCT
- A vision for the development of research at UCT incorporating: greater impact and greater engagement
- Enhancing the quality and profile of UCT's graduates
- Expanding and enhancing UCT's contribution to South Africa's development challenges

This is how the ICT's model of "Enabling People" strategy (discussed further in this chapter) aligns to the above six strategic priorities:

### **Internationalising UCT via an Afropolitan Niche**

- Exploit opportunities to interact with universities in Africa and world-wide using ICT services.
- Engage with other African universities in the sharing of ICT knowledge.

### **Transformation of UCT towards Non-Racialism - Redress, Diversity, Inclusiveness and the Recognition of African Voices**

- Guided by UCT's transformation plans, develop human resources to support the critical shortage South Africa faces in the development of its ICT sector.
- Increase representation of minorities on ICT staff in line with the Information and Communication Services (ICTS) transformation plan.

### **Working towards a Desired Size and Shape for UCT**

- Provide ICT frameworks for continuous process improvements and quality measurements.
- Ensure that all University buildings have internal networking infrastructure for both data and voice networking, and establish monitoring facilities for ICT-critical services.
- Enhance customer service to the UCT community by introducing and enhancing appropriate IS and services.
- Develop ICT governance and reporting structures.
- Govern ICT in a way that is appropriate for an excellent university.

### **A Vision for the Development of Research at UCT: Greater Impact, Greater Engagement**

- Establish and improve ICT facilities needed for research.
- Broaden service delivery to the wider research community.
- Engage with researchers to identify and satisfy research ICT needs.

### **Enhancing the Quality and Profile of UCT's Graduates**

- Exploit the potential of ICT to facilitate a flexible approach to teaching, quality learning and assessment, both on- and off-campus.

### **Expanding and Enhancing UCT's Contribution to South Africa's Development Challenges**

- Guided by the UCT's transformation plans, develop human resources to support the critical shortage South Africa faces in the development of its ICT sector.

Implementing these measures enabled ICT to be seen as a strategic asset. This has, however, been a recent development. While ICT was previously seen as a support tool, the ICT director aimed to change this by using IT/IS to support the university's goals.

### **Innovation by the ICT Director of UCT**

There was one major area that was not totally aligned between the ICT department and the institution and that was the area of research, which is a vital part of Academic Computing. However this is currently being looked at strategically and innovatively. The challenge here was that most researchers were not fully aware of the powerful attributes of IT/IS and on the other hand, IT/IS personnel had difficulty in understanding the specifics of research. The ICT director used some innovative ways to address this by appointing a researcher, a microbiologist, to be a translator between IT/IS and research so as to bridge the gap between the two. UCT was the first university in the country to do this. The ICT director had also run a survey across seven other universities and found there is a similar challenge in all seven universities. This research was presented at a conference in Australia in 2010.

### **The motivation behind having such a strong Information Systems strategy**

Both universities had motivations for having a strong IS strategy and each had their own unique reasons. Shared factors included:

- The right resources;
- The ability, knowledge and permission to explore;
- Motivation to emulate first-world countries;

- Good strategy that was planned with consultation with relevant people;
- A research mindset, and
- Driving the power of IT/IS at board level.

When it came to UP, the process was driven by the strong realisation on the part of the executive management and council over a long period of time that an IT platform was needed. The ability, resources and permission to explore and recommend effective IT/IS systems and solutions promoted UP's strong IS strategy. The need to be comparable with first-world countries was also a driving factor. Furthermore, having a research mindset allowed the ICT director to be more aware of current trends, especially international trends and to try to follow suit.

In UCT's case, the ICT director was employed at UCT in 2008 and at the time UCT had spent R80 million on a technology review and upgrade. However, what they didn't know was that all the other universities were doing the same sort of ICT review and hence UCT had no strategic advantage. All the review meant was upgrading the technology itself, but it had nothing to do with how it could be used strategically. The ICT director then became strategic and implemented the ICT model of Enabling People. He intended to use IT/IS as a strategic enabling tool to do almost anything in the university. The model didn't just focus on using technology strategically, but also on protecting assets, people and data from a technological point of view. An additional motivation was alignment with the business strategies and focusing staff on what needed to be done in order to attain institutional goals and milestones.

### **Hierarchical model present at institutions and its effectiveness**

IT/IS did not sit at board level in both these institutions and both ICT directors were convinced that it should. By IT/IS sitting at board level, it could finally reach full alignment with the institution, as the gap that generally exists at institutions would be addressed. The general feeling was that the power of IT/IS was misunderstood, constrained, limited and underestimated when it was communicated at board level via members of the board rather than being directly represented.

At UP, all staff reported to the Vice-Chancellor (VC); below the VC were the two executive directors of support services. The ICT director reported to one of those directors. IT/IS was communicated at board level via the ICT director's supervisor and not by himself. The recommendations of the King 3 report regarding IT being at board level were being looked at, but it was not clear when a decision would be made.

At UCT, the ICT director reported to the DVC who reports to the VC. The ICT director also served on senior management committees (Risk, Audit and Council). The model was more flat at UCT as it was very consultative and committee driven, and allows for wide participation. The drawback was that issues took longer to be addressed. IT was not at board level at UCT as well and was very much committee driven. The IT director felt strongly that it should be represented at board level.

### **IS model used by the ICT division in terms of IS strategy**

Both universities had their own unique IS models which worked well for them and their institutions. Both the models focused on alignment of IT/IS and the institution. It was evident that using alignment, as a platform for their models was key to their effective IS strategy and strong IT/IS systems.

At UP, as much as their model had no name the model definitely existed and was directed towards a system of Providing and Embedding. The model revolved around catering for all IT/IS needs and tried to embed IT/IS into as many components in the university as possible.

At UCT, the ICT model of Enabling People seemed to be a thriving entity. This model was all about strategically enabling the university to do almost anything via IT/IS. The model did not focus solely on using technology strategically, but as noted earlier, its focus was also to protect assets, people and data from a technological point of view. Enabling People started with the ICT department, as it was more about the ICT personnel listening more to the needs of staff rather than recommending first. This allowed for issues to be smoothly addressed. The model was aligned with the strategic plan for the University of Cape Town 2010 – 2014. The rationale behind Enabling People was that ICT was no longer viewed as a differentiator. The differentiator of the future was made up of the services, which are delivered, and how they were utilised. Enabling People was therefore about making services available, which

academics, researchers, students and administrative staff could use towards achieving the university's strategic goals.

### **Challenges faced by the institution with the model**

At UP, even though organisational culture was strong using this model, certain challenges did exist. One of them was that some executives were reluctant to adopt various IT platforms. Creating a culture between IT/IS and executive management is challenging, but it is being addressed.

At UCT, using this model to be a key enabler to do almost anything did bring challenges but right now the biggest challenge is enabling research through IT/IS.

### **Current systems are used in the area of Academic Computing**

Both universities had expert systems in place and also continued with research into Academic Computing systems in order to implement new systems in the future. Both participants maintained a digital type of environment in the Academic Computing component. However, UCT dominated in the area of Academic Computing. The ICT director of UP was looking into further computing platforms, which were a little limited at the time.

UP's ICT Director conveyed that they tried to sustain a digital platform and also possessed large enterprise architecture. They were using e-Learning tools like Blackboard, which is a commercialized e-learning management tool. It is similar to Moodle, which is being used at UKZN but much more commercial. Students could do tests and assessments electronically. There were also optical marker systems available. Following attendance at seminar presented by Professor Manoj Maharaj of UKZN in 2010, the UP ICT director was looking into podcasting for the future. He also mentioned that they would be looking into further computing platforms in the near future.

UCT on the other hand possessed highly innovative and impressive technology in the Academic Computing component. They were also using an e-Learning management system called Sakei. This is also similar to Moodle but much more advanced. The ICT director stated that, "It is a Research collaboration tool but teaching academics used it all the time."



Podcasting was also being used and was adopted very well by UCT students of UCT. At the time of the interview, podcasts were being uploaded to 50 video recording sites. The university was looking to have five more of these sites by the end of 2011. The following is a detailed report on the technology and systems currently being used by UCT's Information and Communication Technology Services (ICTS).

### **Current Academic Computing technology at UCT**

Research support was added to the ICTS service portfolio in 2009. UCT currently hosted the South African Grids (SAGrids) central service; however, it was expected that more resources would be needed to assist researchers in 2012 and beyond. Two major issues ICT needed to address were the perception of ICT services and specific technical issues.

### **Research Support, Research Computing, Academic Computing (Research Technology Services)**

#### **Research computing, storage, and visualization hardware and software**

- ICTS provided High Performance Computing (HPC) services to a small but growing number of UCT researchers. In the past the trend at UCT was for research groups to fund and build their own, isolated HPC solutions. ICTS was implementing a more cost effective way to provide sustainable HPC capability as well as develop strong in-house HPC capability.
- ICTS has invested in the development of HPC skills in two senior system engineers who have attended several national and international training courses in HPC and Grid computing over the past two years. These staff members now contributed to the training and development of other system administrators in the HPC field at other universities in South Africa and in other African countries.
- As part of ICTS's general hardware life cycle strategy, use is made of high end computing platforms either before they are deployed, or once they are no longer required. The current HPC systems have sufficient flexibility to allow rapid scaling depending on the availability of hardware. Currently the HPC and Grid systems used the SAN for storage.

- The software used to implement the HPC and Grid is open source, which meant that there was minimal investment in licensing. Hardware costs were absorbed by capital expenditure and by far the majority of the research applications were also open source.
- Information about the above initiatives as well as the record of HPC and Grid development at ICTS over the past few years is available on the UCT website (Web1).

### **Research technology services from remote sites**

- HPC infrastructures around the world are connected locally at institutions and therefore sharing these resources with other institutions at a national and international level is limited. Grid technology solved this limitation by introducing a middle-ware solution, which allowed users from other institutions to gain access to HPC resources. UCT's ICTS hosts the core services for the South African National Grid. UCT therefore managed the core of the national SA Grid. This grid consists of eight remotely connected HPC sites within South Africa with which academics and researchers are able to submit complex scientific jobs on a reliable e-Infrastructure.
- The SAGrid has negotiated with other international virtual organisations such as ENMR and EU-MED. This allows national users to participate in international experiments and collaborate with others around the world. This information is also available on the UCT website (Web1).
- The two staff members who supported high performance computing, code porting and grid computing technologies also had other operational support duties.

### **Academic hardware and software that does not relate to instruction**

- At the time of this study there were two clusters, one dedicated to Grid computing, and the other to HPC. The Grid cluster used a mixture of VMs for services and HP BL460 quad core servers for processing. The HPC cluster used a mixture of HP BL20 dual core and HP BL460 six core servers. Both clusters used the Scientific

Linux operating system. The HPC used PBS Torque and Maui for job scheduling. This is an efficient and configurable tool that can support an array of scheduling tasks. The Grid cluster ran gLite 3.2, which is an integrated set of components designed to enable resource sharing. A detailed description of how it is used as a resource sharing component can be found on the glite website (Web2). Both of the above software suites are fully supported by the developers and updates and patches are applied regularly.

### **Discipline-specific applications development, programming, and support not related to instruction**

- A wide range of applications (currently 40+ packages) have been ported to the Grid and HPC clusters. Both clusters support a shared memory model multi-processing environment. This is achieved with the Open MPI libraries and by making use of a networked file system. A multi-threaded environment is also supported on the HPC cluster using the OMP libraries.
- Installation of packages requires a high level of Linux, scripting and programming skills. Before signing off on a package ICTS engineers work with an academic to ensure that the first batch of jobs produces reliable, consistent and predicted results.
- In addition, ICTS engineers assist researchers in optimising code, writing scripts and converting serial applications to the parallel domain in order to increase efficiency.
- Several in-house management tools have been developed to assist ICTS engineers in monitoring and controlling the Grid and HPC environments.

### **General statistical support**

- Statistical support is not offered by ICTS, but rather by the Department of Statistical Sciences and other user groups spread across the institution.

## **Processes or methods used in developing and using powerful IS systems in the area of Academic Computing**

Both universities focused on the aspect of “strategic look and evaluation” of IS. Using IS strategically in the Academic Computing was a key commonality between the two universities. They agreed that having good technology was not the same as using that good technology strategically. Furthermore, keeping abreast of latest international trends was a key priority for both directors.

The UP ICT director said that they took a strategic look at what was beneficial to the teaching, learning and research environment. Accessibility to data was a major issue. It also entailed a very close monitoring of international trends in Academic Computing. He also attended international seminars and conferences and brought back innovative ideas, which were kept within priority. When it came to a holistic approach to Academic Computing, the ICT director had strong collaboration with the Education Innovation Department, where it is housed. This is the key to effective Academic Computing.

At UCT, the ICT director had a Strategic Intelligence work group that has been functional for the past 12 months and at the time of the interview was very much still in the planning phase, but moving forward quite vigorously. The team handled the rolling out of support for all of UCT’s Academic Computing systems. This team worked very strategically when it came to IS in the Academic Computing component and continuously researched that area.

The ICT director also attended international seminars and brought back many ideas that he dedicated time and resources to implementing. He noted that he was the first person to bring a system called Edu-Roam to Higher Education in South Africa and that UCT was the first university to use it. Since then many other universities such as Rhodes University and the University of Free State have adopted this system. Edu-Roam allows one to go to any university in the world on-line, provided those universities have Edu-Roam as well. This then allows one to gain access to these university’s resources like libraries, information, academic resources and much more. This operated through an Edu-Roam log-in. This tool was useful and powerful as it allows sharing and dispersion of knowledge to all parts of the world. It increased communication, networking and skills between institutions, especially third world and/or developing countries, allowing them to access information from first-world countries.

This was especially powerful in the area of Academic Computing, where much development is needed in South Africa.

### **Important benefits of having a strong IS strategy, in the area of Academic Computing**

The universities could not give a detailed statistical report on the academic benefits of strong IS in Academic Computing - for instance, if an x amount of students have passed their courses or scored better in tests and exams through effective IS in Academic Computing - as this competency is housed under an academic department. This was however being researched with the respective departments.

The noticeable benefits in terms of technology were increased scalability, and better response times. There was a growth in student adoption of technology and a tremendous increase in system performance. Both universities were gaining momentum in terms of performance and also reputation.

At UP, in terms of student performances etc, this was more of a question for the Education Innovation Department as they handle Academic Computing and its impact on students. However, there was a tremendous growth in student adoption of technology and IS and also a substantial amount of scalability in terms of performance. This has made the university a better and more attractive place to study.

At UCT, the ICT director noted that while he could not provide the statistical results of Academic Computing, when it came to things like scalability of data, information and technology-orientated processes there were visible benefits. In his view, there was a definite movement towards a technology platform and engagement with technology. They are working on statistical measurements.

### **Future plans**

Both ICT directors showed extreme enthusiasm towards future development in the alignment of IT/IS with institutional strategy. Furthermore plans to enhance systems in Academic Computing in general were cited as priorities. They made it clear that the IT/IS infrastructure was not just seen as a support tool, but as something that will drive the institution into the future and be a strategic differentiator. Both participants want to take alignment to a new

level and also aspire to continually research and monitor international trends and follow international standards when it came to IT/IS in their institutions.

At UP, the new VC seemed to have a great focus on the university's vision, mission and goals. The VC was also re-positioning the university. The ICT director was hence looking forward to working on a new, focused IS strategy seeing that the institutional strategy would be more focused. This would take alignment of both to a new level. The ICT director was also planning to look into podcasting and to pursue the examples of first-world countries in the IT/IS, Academic Computing systems and methods. He said: "Even at present, all of our systems are of international standard as we would like to keep it uniform with the trends of first-world countries and this is definitely on a high priority list."

With regards to UCT, the ICT director's main priority for the future was to finally understand the needs of researchers in terms of technology. As noted earlier, this was the only gap in Academic Computing and he wanted to be the first university to close that gap in South Africa. He wanted to be able to build the technological research tools to be an enabler for research and hence build on the Enabling People model. He had started the process by hiring the microbiologist and they seemed to be making good progress. They wished to use this platform to engage in e-Research. Regarding other plans, the ICT director also planned to advance the university in all other technological avenues and keep on aligning to the fullest.

### **Follow-up statements**

Both ICT directors were convinced that there was a need for more alignment. They indicated that there could never be enough alignment and that there is always room for improvement. However UP's ICT director also wished to address the challenges in the acceptance of technology by some executive members. UCT's ICT director indicated that alignment had to be a priority in any institution. He believed that UCT was aligned but not as closely as he would like it to be. He said that he would keep trying until full alignment was reached, or something very close to full alignment.

UP's ICT director monitored all first-world countries while UCT's ICT director monitored only a selected few international universities but paid close attention to Australian universities as he felt that they were ahead, though not too far ahead, of South Africa. Both respondents felt that there was a link between the IS vision and mission and the institutional

vision and mission at their institutions. It was a case of them continually adjusting to the university's vision and mission and ensuring that they were linking up to it. Both directors felt that current IS strategy in the area of Academic Computing was effective, but that there was still room for improvement and that more growth was needed. In addition UP's ICT director noted that they were well positioned, but not totally effective, hence the need for improvement.

The respondents felt that proper alignment of IS and institutional strategy was paramount and that this was a continual process. UP's ICT director stated that as an IT director, aligning IS with business and enabling business sat at the top of his job description. It was the reason for the existence of any CIO or Director and if one failed to align IS to business, then technology would only take one up to a certain level; then there is no place for differentiation. The potential of IS strategy and technology would never be realized. UCT's ICT director responded that, "proper alignment was the key goal. There were stumbling blocks on the road to achieving proper alignment but if adequate alignment was achieved, much will be accomplished." He added that, "Overall, we have a four year renewal strategy and with this, we plan to see much more uniform scalability in all areas of IS and technology and in all components of the university. This uniformity will be attained by implementing systems that talk to each other. At the moment there are many systems and processes within the university that aren't talking to one another, hence by opening this up with new systems and new technology, uniformity and consistency will be achieved which will further enhance alignment."

#### **4.6 Summary**

This chapter dealt with the analysis of both quantitative and qualitative results. The quantitative results showed that all participants were familiar with the vision and mission statements that existed in both their departments and their institution. All participants were in agreement that the ICT mission and vision statements supported the overall organisational strategy at the institution. There was a strong level of commitment to IS strategy development. The results showed that 18% of the respondents rated the current IS strategy at their institution in relation to overall institutional performance as excellent, 55% rated it very good and 27% as good. The participants were in full agreement that the IS strategy should be

fully aligned with the institutional strategy. There was not a strong organisational culture between the ICT division and the institution with regards to the alignment. Respondents were knowledgeable about the IS systems used in Academic Computing. The results showed that current IS strategy is not working optimally in the Academic Computing component, as only 45% of the respondents rated it as effective. There is therefore a need for more IS in the area of Academic Computing. The interviews revealed that both UCT and UP reflected very strong alignment with institutional goals and strong synergy. Very strong IS strategy and systems were used in the Academic Computing component at both universities. There was also a very strong motivation for the IS strategy at each institution. Both universities have their own unique IS models that are used by the ICT division to formulate IS strategy. Despite the strong current IS and institutional strategy alignment, the respondents conveyed that there is room for further alignment at their institutions. Both institutions reflected a strong organisational culture between the ICT departments and the institution. The analysis of the data will be discussed further in the next chapter. The aims of the study will be addressed, using the findings from this chapter.



## **CHAPTER FIVE**

### **Discussion**

#### **5.1 Introduction**

This chapter will present a discussion of the results set out in chapter four. This chapter will also provide a detailed explanation of both quantitative and qualitative data (interviews) of the two institutions selected for the in-depth analysis. Data on the important aspects of the study will be discussed, namely, the link between vision and mission statements, IS strategy and the institutional strategy alignment and IS strategy in Academic Computing. This chapter will address all of the aims of the study and the results will concur with or refute these aims. The relevant literature will be used to support these findings.

#### **5.2 Findings (Quantitative Results)**

The demographic analysis revealed that more males than females held senior positions in IT at South African universities. A possible reason for this is that more men than women choose the IT field, or that men are more likely to be preferred in senior IT positions for various reasons beyond the scope of this study. The age distribution showed that majority of participants were >50 years old. The reason for this could be the number of years of experience that is required to achieve these senior roles. Many senior managers or executives retain their posts until retirement.

An analysis of the number of years the respondents were employed at the university revealed that more than 50% of the respondents were employed at the university for up to four years as compared to 36% that were employed the university for more than 12 years. Data for the period of employment at current title showed that more than 50% of the respondents were employed for up to four years. This correlated with the number of years the respondents were employed at the university as they were in the same position for that duration. This indicated that these respondents did not leave their place of employment, which could mean that they were content with their job profiles and with working at the institution.

The data collected for participant's current job title showed that the majority of the respondents were ICT Directors. Only 18% were CIOs. Indeed, there should be more CIOs,

as the CIOs in the corporate world are represented at board level along with other executives such as Chief Executive Officers (CEOs), Chief Financial Officers (CFOs) and even Chief Operational Officers (COOs). This would allow IT to be represented at board level and give it an ideal platform to be communicated and understood at that level. This in turn could boost change much more effectively and IT/IS strategies formulated here could be put into action without it being distorted, which is what usually happens when non-IT board members represent IT/IS on behalf of the IT director/manager. The results showed that majority of the participants reported to the DVC (support services). This was seen as positive, as the DVC was primarily involved in strategic planning and therefore has more involvement with IS/IT.

### **Institutional and IS strategy**

In terms of institutional and IS strategy data, the questions were aimed at identifying the association of both strategies. All respondents (100%) were familiar with the vision and mission statements of their institution. All the participants also had knowledge of their departmental vision and mission statements. This is a positive factor towards alignment of IS and institutional strategy. It is important to clearly understand departmental vision and mission statements in order to reach the institutional goals and know where both the institution and department are heading, so that strategies can be devised to get there. This has been supported by Kraftner (2006), who highlighted the importance of understanding both the institutional and IS departmental vision and mission to implement effective IS strategy to support the university's strategic plan. This would eventually lead to the success of the institution.

In response to the question as to whether the ICT vision and mission should always be linked to the institutional vision and mission, the majority of the participants strongly agreed. This was also correlated with Kraftner (2006), who highlighted the importance of understanding the institutional and IS departmental vision and mission and linking the two. All participants were in agreement that the ICT vision and mission statements supported the organisational strategy at their institution and 55% indicated that they very strongly agreed. This was positive and showed that the ICT vision and mission was aligned with the overall organisational strategy. According to Olugbode et al. (2007) the appropriate role of IT in an organisation was typically characterised as a fit or alignment with the strategic goals of the organisation. They added that IT could only be appropriately aligned when the infrastructure put in place to implement the IT strategy is adequate. Once this is accomplished, the IT

strategy would support the organisation's strategy and business processes (Olugbode et al. 2007).

The majority of respondents confirmed that the ICT department was consulted when their institution drafted its vision and mission statements. This implies that the majority of the respondents were involved in the drawing up of the institutional vision and mission statements. Pirani and Salaway (2004) concluded that communication with and the contribution of the key constituents, namely executive management, was critical to creating a culture of strategic alignment. They also emphasised that senior executive support was the key enabler of IT alignment. Similarly, Campbell et al. (2005) asserted that collaboration between IT/IS and management was a prerequisite to attaining alignment and that this must occur at all levels of an organisation.

Overall, participants made high level contributions to the development of the IS strategy at their respective institutions. This indicated the commitment of the respondents to develop strategies and work towards overall organisational success. Pearlson and Saunders (2006) observed that business success needed to be balanced with organisational and IS strategy. IS strategy is only possible through the contribution of IS personnel. Chen et al. (2010) found that an IS strategy worked best when it was a shared role between the IS department and the organisation. They added that in order for an organisation to seek innovation through IS, it had to be viewed as a shared perspective from both entities.

The current IS strategy at the respective institutions relating to improving overall institutional performance was adequate, but there was still room for improvement. The results also showed that the respondents acknowledged the need for improvement in further IS strategy development. According to Chen et al. (2010), an organisation's type of IS strategy had different levels of influence on organisational outcomes such as competitive advantage and firm performance. Furthermore, Bush et al. (2009) found that when an IS was implemented to support and align with overall organisational strategy, the system contributed to top management realising its objectives and thereby enhancing performance.

Sixty-four per cent of the respondents strongly agreed that good IS arose from good IS strategy. As much as this is a positive response rate, it showed that there were still misconceptions in many areas in IS that needed to be addressed in order to achieve a mindset

change. IS strategy is the key constituent for any IS. Piccoli and Ives (2005) found that innovative IS strategy was essential to the development of effective IS and was also critical to the current and future success of an organisation. The majority of the respondents strongly agreed that the IS strategy should be fully aligned with the institutional strategy. This also showed that there was more agreement on alignment of IS strategy and institutional strategy than on the question of whether good IS actually arose from good IS strategy. As discussed earlier this demonstrates the gap in knowledge that exists in institutions and the need to close that gap.

The results for the frequency of IS meetings revealed that there were an inadequate number of meetings (54% being quarterly and less). Meetings are generally the platform for discussions, addressing challenges, planning for change and most important, formulating strategy. Hence regular meetings are critical. The results showed that a significant number of participants agreed that the ICT department was included when major institutional strategies were developed, but 9% of the respondents indicated that they were not consulted and 18% of the respondents did not know if ICT was consulted. This showed that there were some institutions that did not involve ICT in institutional strategic development; this could have a negative impact on institutional strategy outcomes. Pirani and Salaway (2004) noted that institutions that reported more IT alignment exhibited more communication and involvement with critical constituents, especially executive management.

It was found that ICT was consulted on various technological changes and advances. However 18% of the respondents indicated that they were not consulted and 9% did not know. This demonstrates that there was still inadequate consultation and input from ICT with regards to technological advancements and overall institutional changes. The ICT department should be at the forefront of all technological advancement as this falls within their core function. Inadequate consultation could lead to inconsistent alignment. Failure to align IS with institutional strategies can result in lost opportunities, wasted resources, and consequently negative performance (Bush et al. 2007). The majority of the respondents acknowledged that the institution welcomed new ideas from the ICT department from a technological perspective. This indicates that institutions are open to novel ideas and change. This would motivate ICT staff and give them a sense that they are adding value towards the greater goal.

Sixty-four percent of the respondents indicated that there was strong alignment between the organisational culture of the institution and ICT. However, there was no uniformity between institutions, and there was a failure to view organisational culture as of paramount importance. Organisational culture represented the shared ideas of an organisation, taking into account the external and internal environment. Organisational culture can be viewed as the shared ideas of an organisation taking into account the environment by external adaptation and internal integration that are taught to new members as the correct way to solve those problems (Park et al.2004). Serrat (2009) noted that weak organisational culture would result in little alignment with organisational values and goals.

### **Academic Computing**

The results revealed that most of the respondents were strongly knowledgeable in the area of Academic Computing. This was important, as Academic Computing is a core component of Higher Education. However, only 9% of the respondents felt that the effectiveness of the current IS in Academic Computing was excellent, with 45% stating that it was very good. Twenty-seven percent of respondents rated the effectiveness of current IS in Academic Computing as fair. This demonstrated that IS in Academic Computing is currently inadequate. This could be due to a lack of IS itself or a failure to utilise knowledge in this area. Mokhtar et al. (2007) maintained that the use of ICT in Academic Computing was crucial as it enhanced the teaching and learning process, facilitated constant learning and enabled borderless education. Emerging and new technological developments in Academic Computing were critical in supporting learning and innovation (Bradlee and Matthews-DeNetale 2006).

The majority of the participants were knowledgeable about the IS used in Academic Computing in Higher Education in first-world countries. Once again, this demonstrated that knowledge about Academic Computing systems did exist, but was not used effectively. Bournemouth University (first-world) had introduced Academic Computing technologies such as distance learning, virtual learning environments, new media technologies and wireless computing, to name but a few (Kraftner 2006). Bournemouth University's ultimate vision of IS strategy was to support the University's strategic plan and to develop, deliver and support IS (Kraftner 2006). This was just one of many examples of how first-world countries have incorporated effective IS strategy into their vision and mission. This has contributed to proper alignment and had a positive impact on Academic Computing.

There were a vast number of universities around in first-world countries that have adapted to effective IS in Higher Education institutions thereby aligning IS strategy with organisational or institutional strategy. The purpose of this study was to investigate whether developing countries, in this case, South Africa, have followed suit in the innovation and the alignment of IS strategy in its Higher Education institutions. Libya, a developing country, has introduced ICT to enhance all sectors, including the educational sector. This has had a significant impact on the curricula, teaching methodology and learning process in Higher Education in Libya (Rhema and Miliszewska 2010).

The results of this study showed that the respondents had a high level of participation in Academic Computing. This indicated that the respondents supported teaching, learning and research at their respective institutions. Academic Computing is an important producer of information and knowledge (Mokthar et al. 2005). It was found that the current IS strategy did take Academic Computing into account. It is important for IS to incorporate Academic Computing into its strategy due to the vital importance of Academic Computing in a Higher Education institution. Teaching and research are the two most important traditional functions of universities. It has been widely acknowledged that teaching contributed to the enrichment of research and that research contributed to improved levels of teaching (Nguyen 2009).

The results revealed that, overall, the current IS strategy in the area of Academic Computing was not adequate, as only half the respondents rated it as effective. This reflected in the fact that a considerable number of the respondents were not convinced that the current IS strategy was working well in Academic Computing at their institution. Although the current IS strategy takes Academic Computing into account, and the participants play a fundamental role in it, there was clearly an ineffective IS strategy in Academic Computing. This could result from insufficient focus on Academic Computing, inadequate knowledge or underutilisation of knowledge, lack of resources and insufficient alignment in the area of Academic Computing. The current IS strategy needs to be examined critically to ensure that it is working well in Academic Computing, as this is a key area in Higher Education. Higher Education institutions in Malaysia were implementing Academic Computing to provide better education services and to remain competitive in the global knowledge industry (Mokthar et al. 2005). Furthermore, a developing country like Libya was well into implementing effective e-Learning in Academic Computing at Higher Education institutions. The rationale behind

this strategy was to enhance the quality of education by adopting technological academic methods in Higher Education, technologically support and enhance research, develop open and distance learning; and boost the image of Higher Education in Libya (Rhema and Miliszewska 2010).

The results of this study indicated that Academic Computing was given high priority in the current IS strategy. However, this needs to be translated into an effective strategy to enhance Academic Computing. Academic Computing should be given priority at board level. Serious attention should be given to speeding up the adoption of Academic Computing, and to sustaining it once it is in place (Mokthar et al. 2007).

The responses showed that more Academic Computing IS is needed in most of the Higher Education institutions in South Africa. Again, this comes down to alignment, as proper alignment between the institution and ICT could result in more IS strategy within the academic computing divisions in the institution. Pirani and Salaway (2004) observed that proper alignment between an IT or IS department and the organisation became more important as technology emerged as a common thread in institutional activities. Forty-five percent of the respondents rated the priority given to the development of more IS strategy in Academic Computing in their institution as very high and 45% rated it as high. While high priority may be given, there is a need to put it into action. Mokthar et al. (2007) noted that ICT vision and strategies provided direction for decision-making in relation to Academic Computing. This priority should be communicated to the decision makers in the institution so that Academic Computing could be more effective and match the IS strategy employed by first-world countries.

### **5.3 Key Findings (Qualitative Results)**

The findings from the qualitative interviews were presented in chapter four. Key findings are discussed below.

The results showed that ICT and the institution were strongly aligned in both universities. This correlated with the quantitative analysis as 55% of the respondents very strongly agreed and 45% agreed that the ICT vision and mission statements supported the organisational strategy. This showed that there was alignment between ICT and overall organisational

strategy. Both universities reflected large amounts of synergy between the ICT department and the institution. This supported the concept of strong synergy playing a vital role in strong alignment between an ICT department and the institution.

Stronger synergy was shown at UCT as opposed to UP. The UP ICT director felt that acceptance of IT was not uniform at executive management level and that as much as there was good synergy, there was also a need for more uniformity. Furthermore, ICT seemed to be caught between being a support tool and a strategic asset. The UCT ICT director felt that, while his department and the institution were very closely aligned, there was room for improvement. His department tried its best to align as closely as possible to the UCT overall institutional objectives and goals (see chapter four).

A key finding was the innovations introduced by the UCT ICT Director to tackle the area of IT in research. According to the ICT director, research, which is a vital component of Academic Computing, was not totally aligned between the ICT department and the institution. The ICT director critically analysed this problem to reveal that research did not understand IT/IS and vice versa. The ICT director addressed this by appointing a researcher, a microbiologist, to be a translator between IT/IS and research. This was a starting point in bridging the gap between IT/IS and research and showed positive results. The ICT director believed that this would lead to the alignment of both ICT and research. UCT is the first university in the country to do this.

Another key finding was that despite the fact that both institutions reflected the strongest alignment among all institutions in South Africa, both participants conveyed that there was still room for more alignment and that alignment is a continuous process that needed to be monitored, adjusted and evaluated.

Commonly shared motivation between these two universities were factors like having the right resources, the ability, knowledge and permission to explore, motivation to follow first-world countries, good strategy, a research mindset and driving the power of IT/IS at board level. However, in terms of the critical motivation, there were differences. At UP, it was the strong realisation by the executive management over a long period of time that an IT platform was needed. At UCT, the institution had spent R80 million on a technology review with no strategic outlook or advantage. The review did not benefit UCT strategically as most other



universities in the country were undergoing the same technology review. This led the ICT director to become strategic and differentiate UCT from the rest of the universities. The ICT model of “Enabling people” was developed and intended as a “strategic enabling tool” for the university.

Another key finding was that despite strong alignment and excellent IS strategy at both the institutions, IT/IS was not represented at board level. Both ICT directors felt strongly that this should not be the case. IT/IS representation at board level would promote full alignment with the institution.

Both universities had their own unique IS Models, which worked well for them and their institutions. The key finding here was that both ICT directors used alignment as a platform for their models, and this was also the key constituent in their effective IS strategy and strong IT/IS systems. At UP, the ICT model used was entitled “Providing and Embedding”. This revolved around catering for all IT/IS needs and tried to embed IT/IS into as many components of the university as possible. At UCT, the ICT model of “Enabling People” was about strategically enabling the university to do almost anything via IT/IS. The model not only focused on using technology strategically, but, as noted earlier, also embraced protecting assets, people and data from a technological point of view. The model was aligned with UCT’s strategic plan for 2010 – 2014. The ICT director believed that this model led to ICT becoming a strategic differentiator at UCT.

In terms of Academic Computing, UCT seemed to have the edge over UP. Both respondents tried to maintain a digital type of environment in the Academic Computing component. However, the UP ICT was still looking into computing platforms that were a little limited at the time. UP was using e-Learning tools like “Blackboard”, which is a commercialised e-learning management tool. Electronic tests and assessments were also in place, as well as optical marker systems. He also mentioned that they were looking into further computing platforms such as podcasting in the near future.

The University of Cape Town, on the other hand, possessed highly innovative and impressive technology in the Academic Computing component. They were using an e-Learning management system called Sakei, which is a research collaboration tool used mainly by academics. Podcasting was also being used and was adopted very well by UCT students. Currently, UCT is uploading podcasts to 50 video recording sites, and they planned on having

five more of these sites by the end of 2011. A detailed listing of the expert Academic Computing systems used by UCT is provided in chapter four. UCT is way ahead of other universities, especially those represented in the quantitative analysis, as less than half the respondents indicated that the current IS strategy at their institution worked well in the area of Academic Computing.

Key findings were also evaluated in terms of the processes and methods used in developing and using powerful IS systems in Academic Computing. These findings reflected that both ICT directors were continuously researching Academic Computing systems in order to implement new systems in the future. Using IS strategically in the Academic Computing component was a key commonality between the two universities. They agreed that having good technology was not the same as using good technology strategically. Both directors had their own unique approach to developing powerful Academic Computing systems. The UP ICT director took a strategic view of what was beneficial to the teaching, learning and research environment. He also paid close attention to international trends in Academic Computing by attending international seminars and conferences and brought back innovative ideas, which were kept within priority. He also had strong collaboration with the “Education Innovation” department as Academic Computing is housed under that department. Collaboration between his department and the Education Innovation department was the key when it came to effective Academic Computing. Pirani and Salaway (2004) affirmed that institutions that reported more IT alignment were institutions that had greater communication and involvement with critical constituents.

A major key finding came from UCT, where the ICT director had his own Strategic Intelligence work group that had been functional for the past 12 months. The team handled the rolling out of support for all of UCT’s Academic Computing systems. This team worked very strategically when it came to IS in the Academic Computing component and continuously researched this area. The team was still in the planning phase but was moving forward quite vigorously. This is the first ICT department in South Africa to have a Strategic Intelligence work group. The UCT ICT director also attended international seminars and brought back as many ideas as he could, and dedicated time and resources to implementing them. Another major innovation by the ICT director was bringing a system called “Edu-Roam” to Higher Education in South Africa. UCT was the first university to use this system.

Since then many other universities such as Rhodes, and the University of the Free State etc. have adopted this system.

The noticeable benefits of having a strong IS strategy in the area of Academic Computing were increased scalability, response times, increased growth in student adoption of technology and a tremendous increase in the system performance. This was the case in both universities and the universities were definitely gaining momentum in terms of performance and reputation. This did not correlate with the quantitative results as those results indicated that overall, the current IS strategy was not totally adequate and that there was still room for improvement. Furthermore, the quantitative results showed that the respondents acknowledged the need for improvement in further IS strategy development to enhance performance. The UCT ICT director was also planning to statistically monitor the effect of increased IS in Academic Computing on student performances for example, if x more students had passed their courses due to increased Academic Computing systems.

### **Organisational culture between ICT and institution**

A key finding of this study was that both ICT directors felt that organisational culture was pivotal in the alignment of IS and institutional strategy. They noted that the strong synergy between the institution and the ICT department was built on a strong organisational culture. The UP ICT director related organisational culture to the appointment of the new VC and how the new VC was re-positioning the university. The institutional strategy was now more focused. This positive culture was allowing him to work closely with the VC to develop a new, focused IS strategy to align with the new, focused institutional strategy (UP ICT Director 2011). Focusing the IS strategy towards the new institutional strategy would take the alignment of both to a new level (UP ICT Director 2011). The UCT ICT director conveyed that a strong and positive organisational culture was what allowed him to take ICT to new heights and implement systems that were successful, effective and satisfying to the University executive. Employing a microbiologist to be a translator between IT/IS and research fostered a common culture between the two entities (UCT ICT Director 2011). The ICT model of Enabling People was built on a platform of organisational culture, in that it was more about the ICT personnel listening to the needs of staff than recommending first. This allowed issues to be addressed smoothly (UCT ICT Director 2011). A strong organisational culture would play a vital role in driving IT at the board level (UCT ICT Director 2011). The

application of Schein's model to the organisational culture at these institutions is depicted in section 5.4.

### **Commonly shared attributes between the ICT directors**

Both ICT directors showed extreme enthusiasm towards future development of the alignment of IT/IS with institutional strategy. Plans to enhance systems in Academic Computing and in general were a priority. They made it clear that the IT/IS infrastructure would not just be seen as a support tool but something that would drive the institution into the future and be a strategic differentiator. Both participants wanted to take alignment to a new level and to continually research and monitor international trends and follow international standards when it comes to IT/IS at their institutions. The two respondents felt that there is a strong link between IS vision and mission and the institutional vision and mission at their institutions. They continually adjusted to the university's vision and vision, and ensured that they were linking up to it. Both directors felt that current IS strategy in the area of Academic Computing was effective, but that there was still more room for improvement and growth.

### **5.4 Application of Schein's Organisational Culture Model to the Qualitative results**

This study revolved around the application of Schein's Organisational Culture Theory model (1988) as discussed in chapter 3. The model was applied to the organisational culture of the UCT and UP ICT departments. Boisnier and Chatman (2002) observed that a strong culture provided organisations with significant advantages. The benefits of having a strong organisational culture included better aligning the company towards achieving its vision, mission and goals, improved cohesiveness among the various departments and divisions and enabling overall organisational efficiency. Serrat (2009) concluded that organisational culture was said to be strong where employees responded to stimuli because of their alignment to organisational values and objectives. Conversely, there was weak culture where there was little alignment with organisational values and control was more procedural and bureaucratic. This suggests that where organisational culture is strong, there is effective alignment of the organisation with its people to achieve overall organisational goals.

In a study conducted by Iivari and Huisman (2007), the Organisational Culture Theory Model was tested and applied. Iivari and Huisman (2007) analysed the relationship between organisational culture and perceptions about the use, support and impact of systems

development methodologies (SDMs). The motivation for their study stemmed from the fact that SDMs forms an integral part of an organisation and is the central topic in IS. However, despite the efforts devoted to the development of SDMs, there was minimal adoption and usage of it. This inspired them to use and test Schein's organisational culture theory model to identify what was causing the minimal adoption of SDMs. The results showed that organisations with different cultures differed in their perceptions concerning the support provided by SDMs. Organisations also differed in their perceptions concerning the impact of SDMs on the quality of developed systems and the quality and productivity of the systems development process (Iivari and Huisman 2007). Their results also revealed that there was more of a hierarchical culture between managers and IS developers. A commonality needed to be found, and alignment of both the cultures then became a key avenue to promote better adoption of SDMs across an organisation.

In this study, Schein's model was applied to see if stronger organisational culture resulted in higher synergy and cohesion between the ICT department and the institution, which in turn resulted in stronger alignment between IS and institutional strategy. The institutions that were selected for the in-depth analyses were the ones that the model was applied to. The aim was to establish the motivation behind their strong alignment and whether strong organisational culture played a role in the strong alignment between IS and institutional strategies. The model was applied to UCT and UP. Each university had multiple areas of strong culture and hence each area was briefly explained and depicted by diagrams showing the transition from the traditional (weak) culture to the new and current (strong) culture.

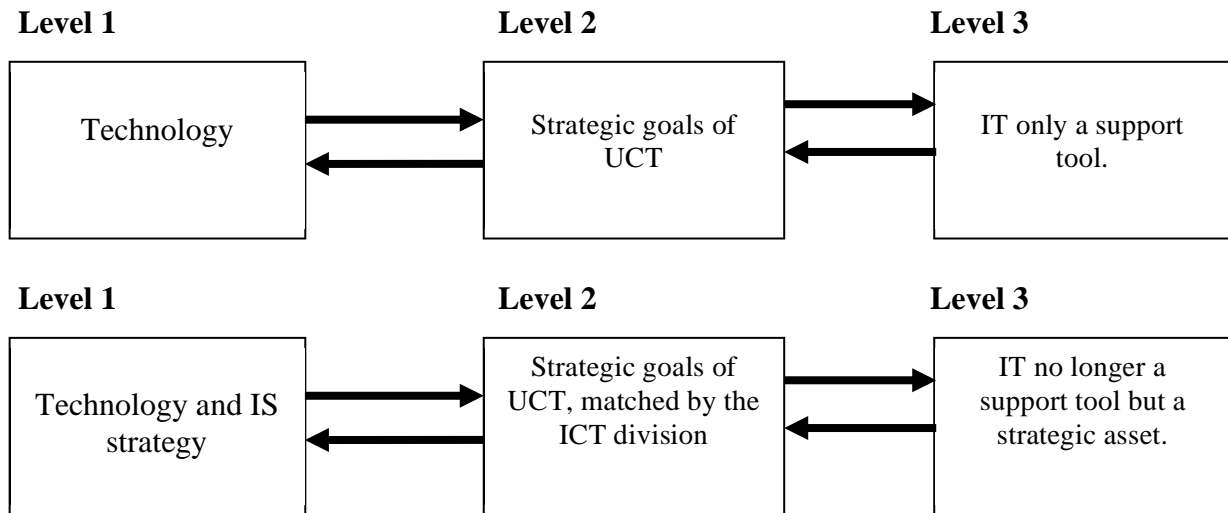
#### **5.4.1 Application of model to the University of Cape Town**

##### **5.4.1.1 Synergy between ICT department and the institution- aligning of ICT to the six strategic goals of UCT**

The espoused values of UCT were the six strategic goals of the institution. The ICT director had aligned his department's espoused values to match and support the institutional espoused values. Technology, coupled with effective IS strategy, was the artifact that made this possible. This took ICT out of the support tool shell and turned it into a strategic asset. The basic underlying assumption was that ICT was a support tool but, due to the espoused values of the ICT department itself and using the technological artifacts, the ICT department met the

espoused values of the institution. By doing this, ICT was now looked at as a strategic asset. It should be noted that this has been a recent event (UCT ICT Director 2011) (Figure 5.1).

**Traditional- weak culture**



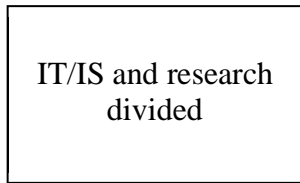
**Figure 5.1:** Organisational culture theory model relating to the synergy between the ICT department and UCT

**5.4.1.2 Addressing the Gap between IT/IS in Research**

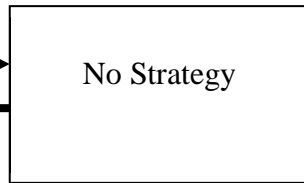
The lack of IT/IS in research and the innovation and determination to change that also pointed towards the strong organisational culture practiced by the UCT ICT director. Relating this to the model, the basic underlying assumption was that research did not understand IT/IS and IT/IS did not understand research. Employing a microbiologist to be the translator between the two entities became an espoused value of the ICT director, making UCT the first university in the country to have done this. This has since shown positive results in breaking the barriers of the basic underlying assumptions between IT and research (UCT ICT Director 2011) (Figure 5.2).

### Traditional - weak culture

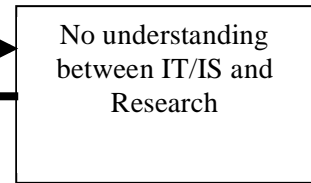
#### Level 1



#### Level 2

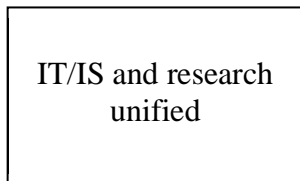


#### Level 3

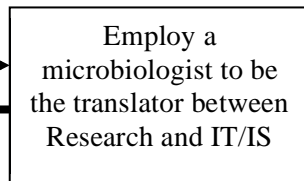


### New- strong culture

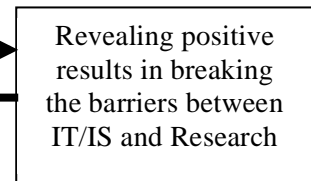
#### Level 1



#### Level 2



#### Level 3

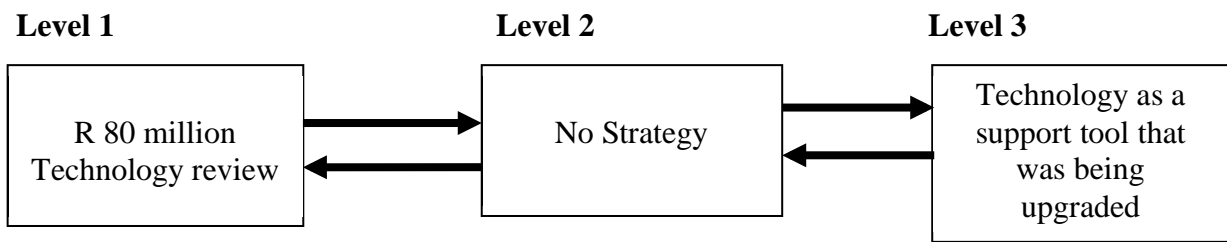


**Figure 5.2:** Organisational culture theory model relating to IT/IS and Research at UCT

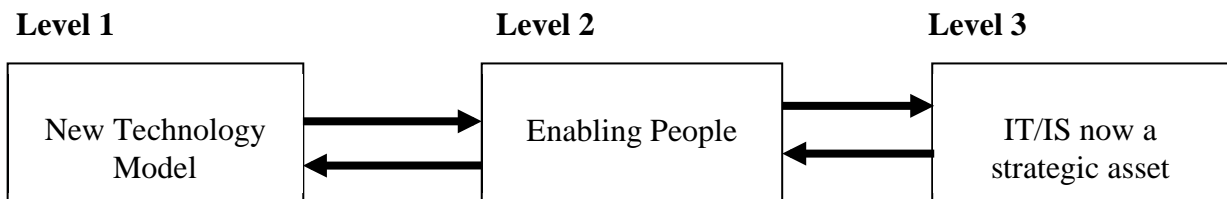
#### 5.4.1.3 Motivation behind the strong IS Strategy

The motivation behind having a strong IS strategy was also dependent on forming a strong organisational culture. UCT had spent R80 million on a technology review and upgrade. The institution assumed that an upgrade of the technology would automatically lead to it being more strategic or advantageous. However, all the other universities were doing the same kind of ICT review and hence it had no strategic advantage (UCT ICT Director 2011). It was merely a technology upgrade and it needed to be used strategically in order to create an advantage. The ICT director then implemented the ICT model of Enabling People, which became an espoused value to use IT/IS as a strategic enabling tool. Thus the R80 million upgrade was integrated into an effective Model (UCT ICT Director 2011) (Figure 5.3).

### Traditional - weak culture



### New- Strong culture



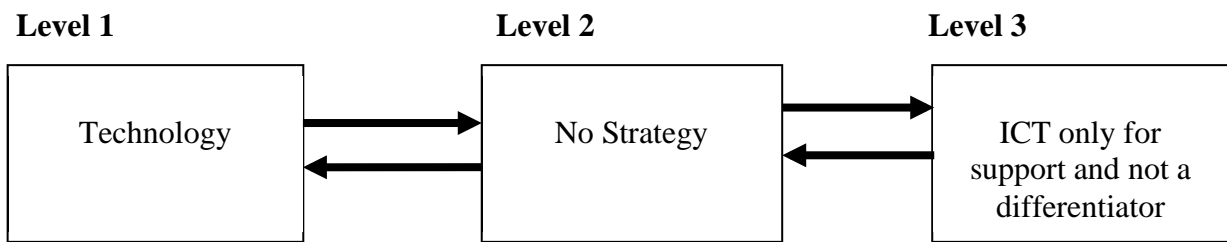
**Figure 5.3:** Organisational culture theory model relating to the motivation behind strong IS strategy at UCT

#### 5.4.1.4 The IS Model used at University of Cape Town

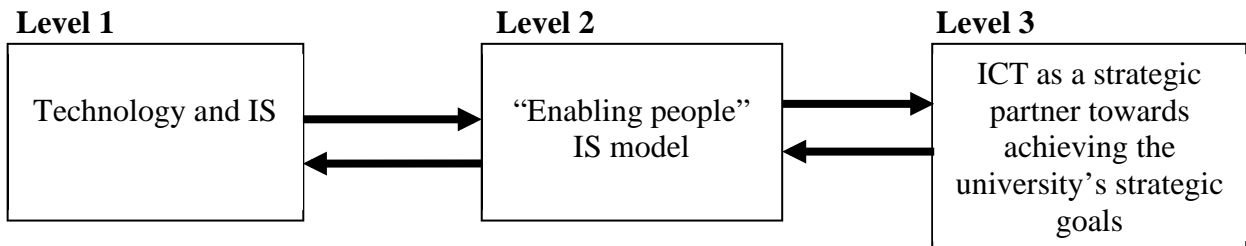
The ICT model of Enabling People was an espoused value for the ICT director. This model was all about strategically enabling the university to do almost anything via IT/IS. The rationale behind Enabling People was that ICT was no longer viewed as a differentiator. The differentiator of the future was made up of the services that were delivered and how they were utilised. Enabling People was therefore about making services available that academics, researchers, students and administrative staff might use towards achieving the university's strategic goals (UCT ICT Director, 2011) (Figure 5.4).



**Traditional - weak culture**



**New - Strong culture**

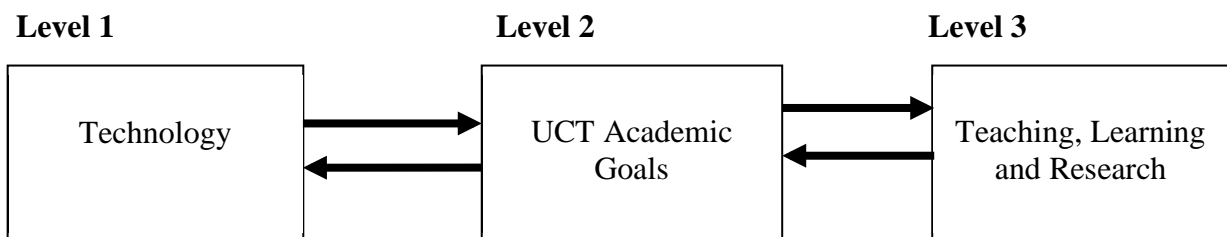


**Figure 5.4:** Organisational culture theory model relating to the IS model at UCT

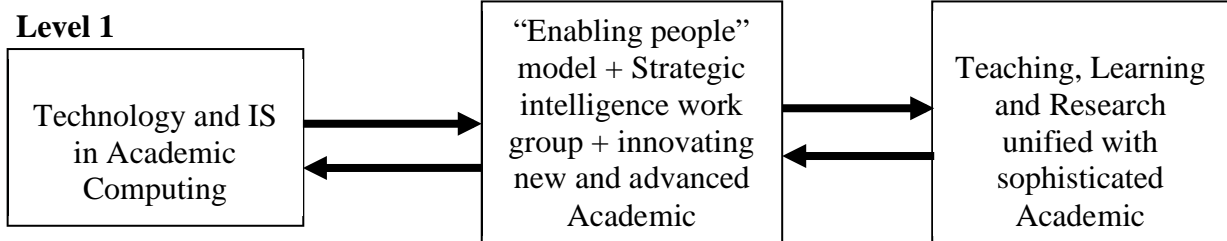
**5.4.1.5 Academic Computing**

The area of Academic Computing was also dominated by the espoused values of the ICT director. Teaching, learning and research were the core activities of the institution, hence the ICT director understood the need for sophisticated IS in Academic Computing. Again the main artifact here was technology coupled with IS. To enhance the organisational culture in Academic Computing, the ICT Director instigated a Strategic Intelligence work group to drive the area of Academic Computing (Figure 5.5).

**Traditional - weak culture**



**New - Strong culture**



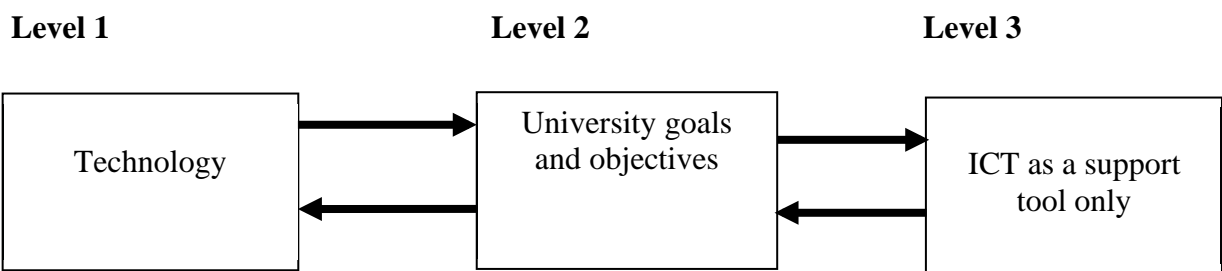
**Figure 5.5:** Organisational culture theory model relating to Academic Computing at UCT

## 5.4.2 Application of the model to the University of Pretoria

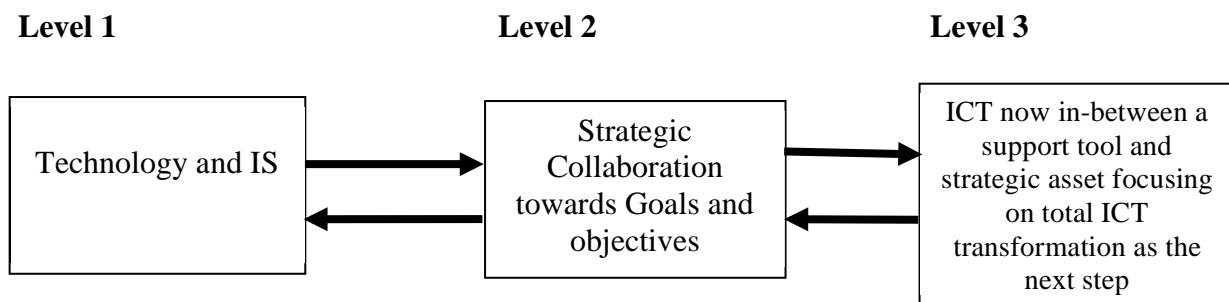
### 5.4.2.1 Synergy between ICT and the institution

The basic underlying assumption by the institution was that ICT was always seen as a support tool. The ICT director has since tried to manoeuvre ICT into becoming a strategic asset. This was done through strategic collaboration, whereby professional and personal relationships were forged with executive management, which created a good platform to engage, put points across and create a means of collaboration (UP ICT Director 2011). ICT had now reached an “in-between perspective”, caught between being a support tool and a strategic asset. The next step was to totally transform ICT into a strategic asset (UP ICT Director 2011). This will also be achieved by means of continual collaboration as an espoused value (Figure 5.6).

#### Traditional - weak culture



#### New - Strong culture



**Figure 5.6:** Organisational culture theory model relating to the synergy between the ICT department and UP

### 5.4.2.2 Motivation behind Strong IS Strategy

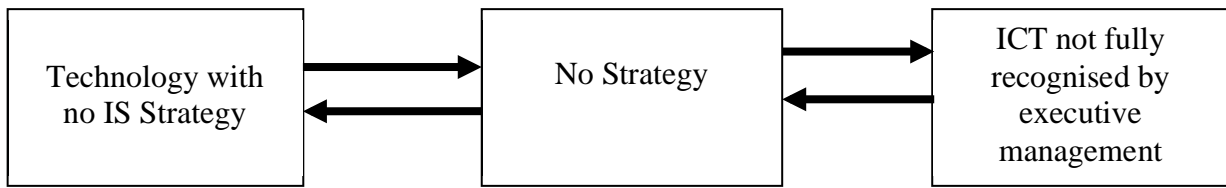
Traditionally, IT was seen as a support tool and was not fully recognised by executive management. Driven by the espoused values of the IT director, the executive management realized that an IT platform was needed. The ICT director’s research mindset to explore and recommend effective IT/IS systems and solutions promoted UP’s strong IS strategy (UP ICT Director 2011) (Figure 5.7).

**Traditional - weak culture**

**Level 1**

**Level 2**

**Level 3**

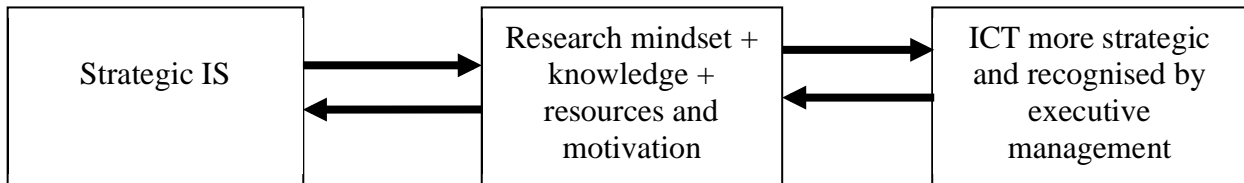


**New - Strong culture**

**Level 1**

**Level 2**

**Level 3**



**Figure 5.7:** Organisational culture theory model relating to motivation behind strong IS strategy at UP

**5.4.2.3 The IS Model used at University of Pretoria**

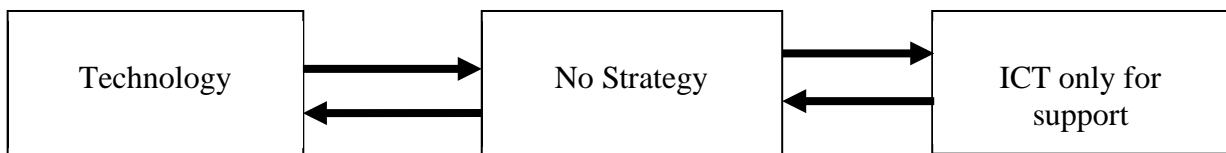
The Providing and Embedding technology model was created by the ICT director. The model revolved around catering for all IT/IS needs and trying to embed IT/IS into as many components of the university as possible. This played a strong role in the organisational culture at the institution in entrenching IS into almost every component of the university and partnering in order to attain the organisational goals (UP ICT Director 2011) (Figure 5.8).

**Traditional - weak culture**

**Level 1**

**Level 2**

**Level 3**

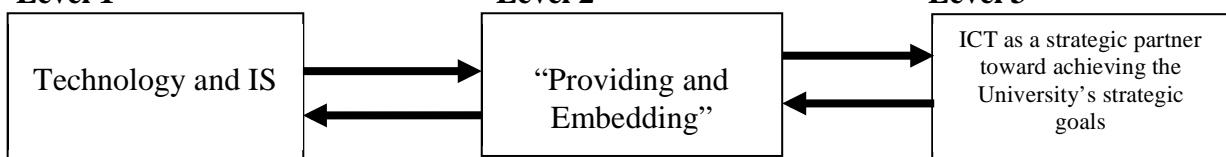


**New - Strong culture**

**Level 1**

**Level 2**

**Level 3**

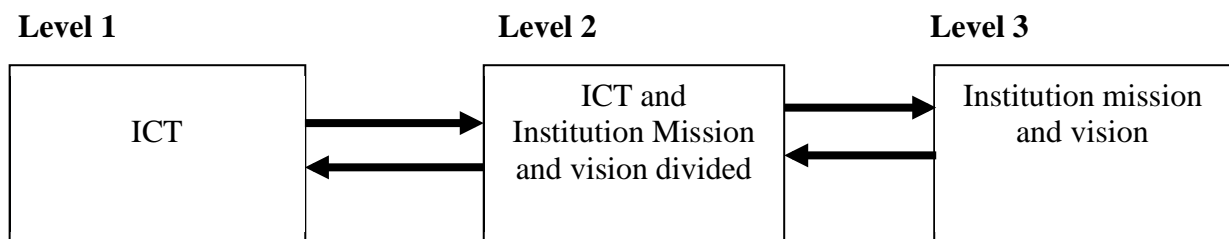


**Figure 5.8:** Organisational culture theory model relating to IS model used at UP

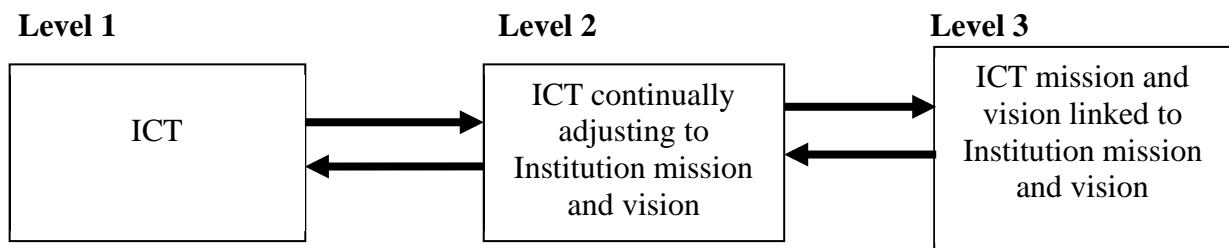
### 5.4.3 Overall culture shared by both Universities

Both ICT directors felt that the link between the institutional vision and mission and the ICT vision and mission was critical. To align both and create a link between them, the ICT directors understood that it was necessary to continually adjust their departmental vision and mission to the university's vision and mission and ensure that they were linking up to it. Proper alignment was the key goal (UCT ICT Director 2011). For them, this was a reflection of strong organisational culture (Figure 5.9).

#### Traditional - weak culture



#### New - Strong culture



**Figure 5.9:** Organisational culture theory model relating to the linking of ICT mission and vision with institutional mission and vision at UP and UCT

### 5.5 Summary

The results of the analysis of the quantitative and qualitative data were discussed in this chapter. The key findings were highlighted. These findings indicate that there is a strong link between IS vision and mission and institutional vision and mission. The results also reflected that the ICT vision and mission statements supported the organisational strategy at the institution. The results also showed that there was an IS strategy in effect at the institutions and that, while the strategy was working, it was limited. Overall, the respondents contributed to IS strategy development, but there is room for improvement in current IS strategies. The results showed that IS strategy should be fully aligned with the institutional strategy. There

was an inadequate organisational culture between the ICT department and the institution with respect to the alignment of IS strategy with institutional strategy.

Academic Computing was accorded high priority at the various institutions. The results showed that the current IS strategy in Academic Computing was ineffective and there was a need for more development in IS strategy in this component. The two selected universities reflected strong alignment between ICT and the institution. Both ICT departments strategically aligned themselves with institutional goals. Both universities reflected very strong IS strategy and systems in the Academic Computing component. Alignment was seen as something that was on going and there was ample room for more alignment at these institutions. Based on Schein's organisational culture IS model, it was found that strong organisational culture played a pivotal role in the alignment of IS and institutional strategy at the selected institutions.

## **CHAPTER SIX**

### **Recommendations and Conclusions**

#### **6.1 Introduction**

This chapter will bring together the findings presented in chapter four and discussed in chapter five. The implications of this research will be discussed. This chapter will also provide recommendations for future research. The research questions will be answered and it will be established if the aims have been addressed.

#### **6.2 Has the problem been solved?**

All the objectives of the study were achieved. This was achieved by collating data from responses from both the questionnaires and interviews. The first objective was to determine the link between IS vision and mission and the institutional vision and mission. The results showed that there is a link between the IS vision and mission and the institutional vision and mission. All the participants were familiar with the mission/vision statements that existed in both their institutions and departments. There was also strong agreement that the ICT vision and mission should always be linked to the institutional vision and mission. Furthermore, the participants' responses revealed that there was very strong agreement that the ICT mission/vision statements did support the overall organisational strategy at their institution. Respondents to both the questionnaires and interviews concurred that there was a link between IS vision and mission and institutional vision and mission, and that it was critical for this link to be in place.

The second aim of the study was to critically evaluate the current IS strategy vis-à-vis the institutional strategy by assessing the opinions of IS personnel from selected Higher Education institutions in South Africa. The results showed that there was a strategy in place, and that the strategy did work for the various institutions. The universities selected for the interviews had excellent current IS strategies and the motivation behind strong IS strategy commonly shared between these universities was the right resources, the ability, knowledge and permission to explore, motivation to follow first-world countries, good strategy that was planned with consultation with the relevant people, a research mindset, and, driving the power of IT/IS at board level.

The final aim was to determine the effectiveness of the current IS strategy in the area of Academic Computing. More than half of the respondents indicated that the IS strategy was not effective. Furthermore, the majority of the respondents indicated the need for more IS strategy in Academic Computing at their institutions. The interviews with the ICT directors of the two selected institutions, however, reflected that both institutions had strong IS strategy in Academic Computing. UCT had excellent systems in place in the area of Academic Computing, including research computing, storage, and visualization hardware and software, research technology services from remote sites, discipline-specific applications development, programming, e-Learning tools, podcasting and others detailed in Chapter 4.

### **6.3 Implications of this Research**

This research has contributed to the area of IS and institutional strategy alignment. It further contributed to the area of Academic Computing, which encompassed teaching, learning and research. Alignment of IS and institutional strategy as well as its impact on Academic Computing, is a fundamental area in the functionality of a university. There was a paucity of research on this subject, especially in developing countries. This study has highlighted the challenges that exist and answered questions that governmental institutions have struggled with. The effectiveness of IS strategy in Academic Computing is an area that requires further research.

Academic staff and students will benefit from this study. ICT staff will also benefit by understanding the need for good IS strategy and the alignment of this strategy within an institution. The study also promotes an understanding of the need for more IS in the area of Academic Computing. Other stakeholders who will benefit from this study include executive management (support and academia) at Higher Education institutions, and the entire Higher Education sector, including the Department of Higher Education and Training. ICT management and executive management of the institutions will be encouraged to acknowledge the need for representation of IT/IS at board level.

### **6.4 Recommendations to solve the research problem**

The study revealed that there was strong alignment between IS strategy and institutional strategy; however this was not as close as it should be. There needed to be more collaboration

and consultation between the IS department (ICT) and the institution. A strong organisational culture between ICT and the institution needs to be established in order for alignment to be effective. Representation of IT at board level to effect the IS strategy and to translate it in order to make it work, is critical. It has been shown that there is a lack of IS strategy in the area of Academic Computing. This can be addressed by sharing information between institutions. The weaker universities would gain much by learning from those who are in the lead with regards to strategies that have been proven to work. Institutions should follow the lead of UCT and UP in respect of continuously adjusting and evaluating alignment between IS and institutional strategy. Following UCT's example, institutions should create greater engagement in the development of IT/IS in research.

Institutions should look at trends, strategies and new technologies that are used by universities such as UP and more specifically UCT, which are leading in Academic Computing in South Africa. Institutions should implement Academic Computing interventions such as podcasting (50 podcasting video recording sites are used at UCT), Web 2.0 technology, and web-based learning such Edu-Roam. High Performance Computing systems should be implemented to enhance research and research collaboration through reliable e-Infrastructure. Institutions should also invest in other systems that have been proven to work in Academic Computing and follow the trends in first-world countries.

## **6.5 Recommendations for Future Studies**

This study population was targeted at only IS management at the various universities. The study could be extended to incorporate other job profiles within the ICT department such as IS development personnel and other ICT employees involved in IS strategy development and implementation. The study could also be extended to obtain input from technology users, especially in the area of Academic Computing, such as academics, researchers, and lecturers. This would provide a different perspective and provide information on what users need.

The study could also be extended to include university students to evaluate the effectiveness of IS in the classroom as a tool for learning.

The following future studies are recommended:



- Alignment of IS strategy in governmental sectors such as healthcare, sports and recreational, agriculture, trade, tourism etc.
- Lack of IT/IS in research in South Africa.
- Effectiveness of IT/IS in Academic Computing in Higher Education.
- Measuring the academic performances of students vis-à-vis increased IS in Academic Computing.

## **6.6 Summary**

This chapter concluded the study. It addressed the research questions to determine if the problem was solved. The findings of the study did answer the research questions. These findings revealed that there is a strong link between IS vision and mission and institutional vision and mission. These need to be aligned to achieve institutional objectives. The need for strong alignment between institutional and IS strategy is fundamental. The results also showed that currently there is an IS strategy in effect at the institutions and that the strategy was working, but it was limited. Respondents contributed to IS strategy development, but current IS strategies show room for improvement. The results show that IS strategy should be fully aligned with the institutional strategy. Furthermore, the results showed that the current IS strategy in Academic Computing was ineffective and that there is a need for more development in IS strategy in this component. Institutions such as UCT and UP reflect very strong alignment and have excellent IS in Academic Computing. These institutions also reflected strong synergy between the IS and institutional vision and mission. This study hence indicated that there are Higher Education institutions in South Africa that are embracing effective IS strategies and innovations similar to first-world/developed countries.

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# Appendix 1- Ethical Clearance



Research Office, Govan Mbeki Centre  
Westville Campus  
Private Bag x54001  
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14 March 2011

Mr S Suknunan (209510952)  
Graduate School of Business  
Faculty of Management Studies  
Westville Campus

Dear Mr Suknunan

**PROTOCOL REFERENCE NUMBER: HSS/0117/011 M**  
**PROJECT TITLE: The Impact of Institutional and Information Systems Strategy Alignment on Academic Computing divisions within Higher Education.**

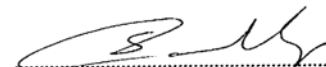
In response to your application dated 11 March 2011, the Humanities & Social Sciences Research Ethics Committee has considered the abovementioned application and the protocol has been granted **FULL APPROVAL**.

Any alteration/s to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through the amendment /modification prior to its implementation. In case you have further queries, please quote the above reference number.

**PLEASE NOTE:** Research data should be securely stored in the school/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours faithfully



.....  
Professor Steven Collings (Chair)  
HUMANITIES & SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE

cc. Supervisor: Prof M Maharaj  
cc. Mrs Christel Haddon

## Appendix 2- Informed Consent Letter

Dear Respondent,

### **MBA Research Project**

**Researcher:** SachinSuknunan (031 260 3579)

**Supervisor:** Professor Manoj S Maharaj (031 260 8003)

**Research Office:** Ms P Ximba 031-2603587

I, **Sachin Suknunan**, an MBA student at the **Graduate School of Business**, of the University of Kwazulu Natal. You are invited to participate in a research project entitled **The Impact of Institutional and Information Systems Strategy Alignment on Academic Computing divisions within Higher Education**. The aim of this study is to:

- To determine the link between IS Mission and vision and the Institutional Mission and vision.
- To critically evaluate the current IS strategy *vis-a-vie* the institutional strategy by assessing the opinions of IS personnel from selected HE institutions in South Africa.
- To determine the effectiveness of the current IS strategy in the area of Academic computing.

Through your participation I hope to understand the link and synergy between IS mission and vision and institutional mission and vision. I also hope to understand the effectiveness of the current IS strategy in the area of Academic Computing. The results of the questionnaire and interview are intended to contribute to me fulfilling my objectives of the study as well as answering the research questions intended in the study.

Your participation in this project is voluntary. You may refuse to participate or withdraw from the project at any time with no negative consequence. There will be no monetary gain from participating in this survey/focus group. Confidentiality and anonymity of records identifying you as a participant will be maintained by the **Graduate School of Business, UKZN**.

If you have any questions or concerns about completing the questionnaire or about participating in this study, you may contact me or my supervisor at the numbers listed above.

The survey should take you about 15 minutes to complete. I hope you will take the time to complete this survey.

Sincerely

Investigator's signature

A handwritten signature in blue ink, consisting of stylized, cursive letters that appear to be 'Suh'.

Date 08/03/2011

**This page is to be retained by participant**

**UNIVERSITY OF KWAZULU-NATAL  
SCHOOL**

**MBA Research Project**

**Researcher:** SachinSuknunan (031 260 3579)

**Supervisor:** Professor Manoj S Maharaj (031 260 8003)

**Research Office:** Ms P Ximba 031-2603587

**CONSENT**

I..... (full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

**SIGNATURE OF PARTICIPANT**

**DATE**

.....

---

Line-Manager's consent

I, ..... (Full names of supervisor/line-manager of participant), hereby give consent to my subordinate to part-take in this research study.

.....

.....

Signature of Line-Manager

Date

.....

University Stamp

This page is to be retained by researcher

### **Appendix 3- Questionnaire**

# **UNIVERSITY OF KWAZULU-NATAL GRADUATE SCHOOL OF BUSINESS**

## **MBA Research Project**

**Researcher:** SachinSuknunan (078 170 4497 / 031 260 3579)

**Supervisor:** Professor Manoj S Maharaj (031 260 8003)

**Research Office:** Ms P Ximba 031-2603587

**Title: The Impact of Institutional and Information Systems Strategy Alignment on Academic Computing divisions within Higher Education**

The purpose of this survey is to solicit information from you and my other respondents regarding the alignment of information systems strategy and institutional strategy and its impact on academic computing at your institution. The information and ratings you provide us will go a long way in helping us identify if a gap exists between the alignment of information systems strategy and institutional strategy as well as its impact in Academic computing hence also meeting the objectives of this study. The questionnaire should only take 10 to -15 minutes to complete. In this questionnaire, you are asked to indicate what is true for you, so there are no “right” or “wrong” answers to any question. Work as rapidly as you can. If you wish to make a comment please don’t hesitate to add it. Make sure not to skip any questions.

Thank you for participating.

## Section A- Demographics

### Title

<input type="checkbox"/>	Mr
<input type="checkbox"/>	Miss
<input type="checkbox"/>	Mrs
<input type="checkbox"/>	Dr
<input type="checkbox"/>	Professor

### Gender

<input type="checkbox"/>	Male
<input type="checkbox"/>	Female

### Age

<input type="checkbox"/>	< 21
<input type="checkbox"/>	21- 30
<input type="checkbox"/>	31- 40
<input type="checkbox"/>	41- 50
<input type="checkbox"/>	> 50

## Section B – This Section focuses on your current occupation

### 1. How long have you been at this Institution?

<input type="checkbox"/>	Up to 4 years
<input type="checkbox"/>	5-8 years
<input type="checkbox"/>	9-12 years
<input type="checkbox"/>	> 12 years

### 2. What best describes your current title at this institution?

<input type="checkbox"/>	Chief Information Officer
--------------------------	---------------------------

- ICT Director
- ICT Manager
- Other, state: \_\_\_\_\_

**3. How long have you had the above role in Question 2?**

- Up to 4 years
- 5-8 years
- 9-12 years
- > 12 years

**4. Who do you report to?**

- Vice Chancellor
- Deputy Vice Chancellor (Research)
- Deputy Vice Chancellor (Academic)
- Deputy Vice Chancellor (Support services)
- Executive Dean
- CIO
- IT director
- IT Manager
- Operations / Facilities Manager
- Other, state: \_\_\_\_\_

**Section C- This Section focuses on the Institutional and IS Strategy**

**5. Are you familiar with the mission/vision statements that exist at your institution?**

- Yes
- No

**6. Are you familiar with the mission/vision statements of your department?**



- Yes
- No

**7. In your opinion, how strong is the current link between the ICT mission/vision statements and the institutional mission/vision statements at your institution?**

- Very Strong
- Strong
- Average
- Weak
- Very weak

**8. The ICT mission/vision should always be linked to the institutional mission/vision.**

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**9. The ICT mission/vision statements support the overall organizational strategy at your institution.**

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**10. Does the institution consult the ICT department when drafting its Mission/vision statements?**

- Yes
- No
- Don't know

**On a rating of (1- poor, 2- Fair, 3- Good, 4- Very Good, 5- Excellent), Please answer the following questions.**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>11. Please rate your level of contribution to IS strategy development at your institution?</b>					
<b>12. How would you rate the current IS strategy at your institution in terms of it improving overall institutional performance?</b>					

**13. Good information systems arise from good information systems strategy.**

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**14. The information systems strategy should be fully aligned with the institutional strategy.**

- Strongly agree
- Agree
- Neutral
- Disagree
- Strongly Disagree

**15. How often do you and your department hold Information systems strategy meetings?**

- Weekly
- Monthly
- Quarterly
- Yearly
- Never

**16. Does the institution's strategic planning department include the strategy from the ICT department when developing major institutional strategies?**

- Yes
- No
- Don't know

**17. Does the institution consult ICT on various technological changes/advances?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
<input type="checkbox"/>	Don't know

**18. In your opinion, does the institution welcome new ideas from a technological perspective from the ICT department?**

<input type="checkbox"/>	Yes
<input type="checkbox"/>	No
<input type="checkbox"/>	Don't know

**19. In your opinion, how strong is the organizational culture between the ICT department and the Institution in respect to the alignment of Information systems strategy with Institutional Strategy?**

<input type="checkbox"/>	Very Strong
<input type="checkbox"/>	Strong
<input type="checkbox"/>	Average
<input type="checkbox"/>	Weak
<input type="checkbox"/>	Very weak

**Section D- This will focus on Academic Computing**

**On a rating of (1- poor, 2- Fair, 3- Good, 4- Very Good, 5- Excellent), please answer the following questions.**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>20. What is your knowledge of the information</b>					

<b>systems used in the Academic Computing component of your institution?</b>					
<b>21. How would you rate the effectiveness of the current Information systems in the Academic Computing Component at in your institution?</b>					
<b>22. What is your knowledge of Academic Computing information systems used at HE Institutions in First-world countries? e.g. (podcasting, E-learning, virtual learning etc)</b>					

**23. To what level would you describe your involvement with the current Information Systems in the Academic Computing Component?**

- Very High
- High
- Medium
- Poor
- Very Poor

**24. In your opinion, does the current IS strategy take into account the component of Academic Computing?**

- Yes
- No

**25. In your opinion, do you think that the current IS strategy is working well in the academic computing component of your institution?**

- Yes

- No
- Don't know

**26. In your opinion, what priority does Academic Computing hold in the current IS strategy?**

- Very high
- High
- Medium
- Low
- Very low

**27. Is there, in your opinion, a need for more IS strategy in the Academic computing component at your institution?**

- Yes
- No
- Don't know

**28. What priority would you give the development of more Information systems strategy in the Academic Computing component at your institution?**

- Very high
- High
- Medium
- Low
- Very low

**End of the Questionnaire**

Thank you for taking the time to complete the questionnaire.

## **Appendix 4- Interview Schedule**

### **The Impact of Institutional and Information Systems Strategy Alignment on Academic Computing divisions within Higher Education**

Thank you for agreeing to participate in this research. Please be assured that any information provided will be held in the strictest confidence. With your permission, I will record the interview and will submit a transcript for your approval afterwards. If you request that the information you provide should not be attributed to you, your wishes will be respected. Data collected for the purpose of research will not be used for any other purpose without obtaining your permission for any alternative or additional use.

The following research focused on the **The Impact of Institutional and Information Systems Strategy Alignment on Academic Computing divisions within Higher Education**. The research will investigate the extent of the alignment of Information systems strategy with institutional strategy. It will also focus a fair degree on the impact that the current Information systems strategy may have on Academic Computing which is a fundamental area in higher education.

Research questions:

- Question 1: What is the extent of the synergy (if any) between IS mission/vision and the institutional mission/vision at South African Higher Educational institutions.
- Question 2: How effective is the IS strategy in the area of Academic computing (from research participant's opinion).

**The objectives of the interview will be:**

- To establish the motivation/attitude behind what makes this institution possess such an effective Information systems strategy.
- To determine the processes involved in developing a powerful information systems strategy.
- To learn more about the systems used in the Academic Computing component at this institution.
- To identify synergy of the relationship between the ICT department and the Academic side of the institution.

Alignment of Information systems strategy and institutional strategy and its impact on academic computing has not been a something that has been researched in the past in South Africa. Considerable amount of research and application of this topic exists in first-world countries which also seems to show that alignment of the two strategies produce positive results in higher education. I am hoping to use this as a platform in creating an awareness of the potential of aligning the two strategies hence opening the doors for improvement and further studies in this avenue in South Africa.

Your participation in this research is appreciated.

Sachin Suknunan  
March 2011

[suknunan@ukzn.ac.za](mailto:suknunan@ukzn.ac.za)  
078 170 4497  
031 260 3579



## DEMOGRAPHICS

Please summarize your own background and experience in IT in your current and in other previous positions / organizations

### 1. Job description

CIO	
IT Director	
Divisional IT Manager	
IT Manager	
Business Manager	
Other	

### 2. What are your main functional roles?

Information Technology	
Strategy & Planning	
Business Development	
General Management	
Operations	
Research & Development	
Network Management	
Other	

### 3. How long have you been in the above role?

0-5 years	
6-10 years	
11- 15 years	
16- 20 years	
>20 years	

## **Interview Questions (Broad-based)**

- 1. What is the extent of the synergy between ICT Department and the overall institutional management?**
- 2. Describe the motivation behind having such a strong Information Systems strategy?**
- 3. What sort of hierarchical model is present at this institution and how effective is it?**
- 4. What IS model does the ICT division use in terms of IS strategy?**
- 5. What systems are currently used in the area of Academic Computing?**
- 6. What processes or methods are used in developing/using powerful IS systems in the area of Academic Computing.**
- 7. What were noticeable benefits of having a strong IS strategy, in the area of Academic computing?**
- 8. Where to from here?**