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The Organisational Impact of Implementing Integrated IS in HE institutions: a case study from a UK University

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Abstract: This paper explores the implementation process of integrated Information Systems (IS) in Higher Education (HE) institutions. This is achieved through the analysis of a HE institution's strategy during the implementation process of the integrated IS and the impact that the new system had on the working practices of the HE institution. Through the use of interviews, the research indicates that there has been a growth of alternative power bases within the university, new roles and responsibilities for administrative staff and a different working environment for academics.

1 INTRODUCTION

The roots of modern Higher Education (HE) in the UK appears to have emerged in medieval times (Barnett, 1990) when HE was mainly available to the rich. Since World War II HE has been available to the middle classes while in recent times it has been associated with mass education and increasing numbers of students. These changes were created by a number of interrelated pressures in the Higher Education sector: expansion of Higher Education, changing student profile, pressures from industry, increased competition and information technology (IT) capability (Armstrong et al., 1997; Ford et al., 1996; Slowey, 1995).

In HE institutions, as in many other organisations Information Systems (IS) started as in house developments that tended to satisfy the immediate needs of the different departments and schools. As the universities continued to grow and become international organisations, incorporating students from all over the world, their needs changed and the need for integration intensified (Cornford and Pollock, 2003; Pollock and William, 2009). More specifically Lewis *et al.* (2005) recognise that universities have been undergoing a period of rapid transformation that has seen notions of academic collaboration, knowledge sharing and community engagement. Added to the changing values is the more recent push towards reconceptualising universities as informational and more integrated organisations.

An early study by Mutch (1997) suggests that despite the enormous expenditure on information technology, many organisations still feel uncertain whether they realise, much value, from their investment. He argues that in many cases matters could be said to be getting worse, as computers are able to generate huge quantities of data which are either misused by or overwhelm those who are on the receiving end (Mutch, 1997:377). This situation seems to have continued in recent years since organisations, in particular Higher Education institutions, seem to make huge investments on integrated information systems such as Enterprise Resource Planning (ERP) systems; however they do not seem to achieve the full potential of these systems (Pollock and Williams, 2009). Thus, the focus of this research is to further explore and understand the organisational impact that integrated IS have on HE institutions.

Previous research (Wainwright and Waring, 2004; Gajendran and Brewer, 2012) takes a holistic view of information systems' integration and argues that it is beyond "technical" perspective but it is important to also include other perspectives such as organisational, strategic, operational, etc. Therefore, this research is using a theoretical framework that examines the implementation of an integrated IS from a variety of perspectives with an emphasis on organisational aspects. The findings and discussion are structured according to the organisational aspects highlighted by the Wainwright and Waring (2004) theoretical framework which will be discussed in detail in section 2.2.3.

This paper consists of four main sections. Section two provides a brief review of the pertinent literature in aspects related to universities as organisations and integrated IS implementation in HE institutions. Section three reviews a theoretical model for the implementation of integrated IS. Section four discusses the methodology underpinning this research while sections five and six present and discuss the findings of the HE case study. Finally section seven draws relevant conclusions and suggests future research in the area of integrated IS implementation in the HE sector.

2 LITERATURE REVIEW

Before exploring the current literature on the implementation of integrated IS in HE institutions it is important to understand the organisational aspects of universities in order to better understand the nature and complexity of the HE sector.

2.1 Universities as Organisations

Due to the increasing numbers of students in Higher Education, the formalization of universities has become inevitable and funding for mass Higher Education has brought increasing demand for accountability (McNaught and Vogel, 2006). Nowadays, many students are looking for clear links to professional careers rather than just growth in their own personal knowledge and understanding. Consequently this has increased the use of business models and methods by senior management in the HE sector which in turn has led some universities to identify themselves as corporate (McNaught and Vogel, 2006). However, can universities be solely corporate?

In some very insightful research McNay (1995) identified that the universities of the 21st Century are increasing in diversity and in an effort to shed light in this growing diversity, he classified universities into four types, the corporate, the collegium, the bureaucratic and the enterprise university.

The collegium, characterised by its lack of central control and high level of autonomy; the bureaucracy with its fairly loosely defined policy but tightly controlled rules and regulations for organisational practices; the corporation with its characteristically strong central control over both policy and implementation; and the enterprise, an organisational model marked by clear central goals but a considerable degree of autonomy in relation to how those goals are carried out. While universities tend to be a complex mix of all four organisational cultures, McNay (1995) argues that over the years universities have been progressing from a primarily collegial organisational structure through bureaucratic and corporate modes to a predominantly enterprise style.

The important differences between the types of university are not structural but relate more to relationships and values. What is important to keep in mind is that universities do not fit neatly into one mode or other and all have aspects of both corporate and collegium systems (McNaught and Vogel, 2006). However, the growth in size of the modern university has resulted in a growing emphasis on systems of budgeting and resource allocation, financial accounting, personnel management and infrastructure planning and all these are characteristics of a corporate university. Nowadays, universities also feel the emerging need to integrate all their disparate systems in order to be able to satisfy the students' needs more effectively and to utilise information to support a growing need for Government statistics in particular from HEFCE.

2.2 Integrated IS in the HE sector

Integrated Information Systems (IS) are increasingly being utilized throughout business and industry. They bring to organisations the promise of seamless information flows and ultimately competitive advantage for the implementing organization. The difficulty for most organizations is that they have in place information systems and working practices that have grown up over a period of time and often fail to realize how integrated IS have the potential to change the way they do business (Koh et al, 2011). This so-called 'best practice' is determined by software vendors, management consultants and industry-based experts frequently working in partnership with a key industry customer to develop a package to meet the unique requirements of that particular industry (Pollock and Williams, 2009).

Ifinedo et al. (2010) argue that much of the literature on integrated IS has tended to focus on the adoption of these systems but they suggest that there is little consensus between researchers and practitioners when it comes to assessing the impact of enterprise systems in organizations.

Researchers suggest that social and organisational issues are the most important aspects of integrated IS implementations (Kayas, 2008; Boersma and Kingma, 2005; Elbana, 2007) and Orlikowski and Iacono (2001) urge IS researchers to engage in more explicit research regarding the cultural and organisational presence of the information technology. Kallunki, Laitinen and Silvola (2011) argue that integrated IS can be seen as an umbrella which management use in order to gain a wider control across an organisation. Thus an integrated IS can be used either to centralise control of top management or to decentralise power to demonstrate more visible management control throughout the organisation.

In terms of sector studies there is a wealth of research in manufacturing and supply chain management (Bu'rcá, Fynes and Marshall, 2005; Koh, Saad and Arunachalam, 2006; Motwani et al., 2002 and Yusufa, Gunasekaranb and Abthorpe, 2004). One growing area of integrated IS

research is in the area of Higher Education (HE) (Trowler, 1998; Becher and Trowler, 2001; Cornford and Pollock, 2003; Pollock and Cornford, 2004; Cramer, 2006; Mutch, 2008; Fowler and Gilfillan, 2003; Gemmell and Pagano, 2003; Wagner et al., 2006; Sabau et al., 2009; Pollock and Williams, 2009). Nevertheless there are few studies that explicitly use an organisational lens to explore the influence these systems have within the organisation.

As Alt and Auth (2010) argue research and theory building in the area of implementation of integrated IS in HE institutions is still in its infancy. Nevertheless, Lechtchinskaia, Uffen and Breitner (2011) identified a number of CSF for the implementation of integrated IS which are specific to the HE sector. Through a comprehensive literature review they found that change management and organizational culture were two factors that draw most attention and they suggest that due to the fragmented organizational nature of HE institutions a different approach is needed to research compared to ERP implementations in private companies and cultural issues should be at the forefront of this.

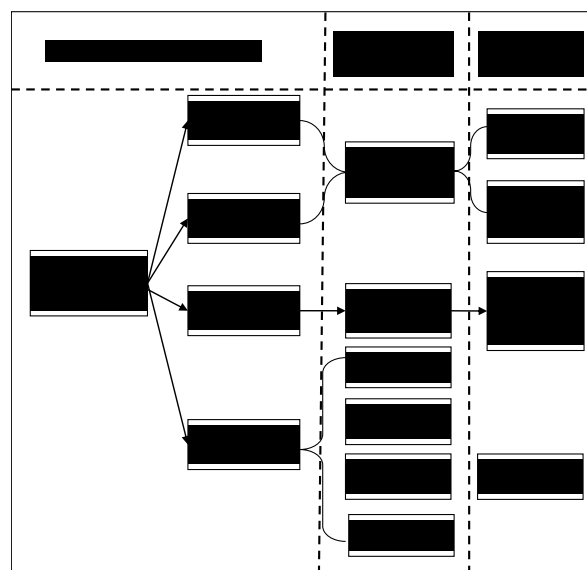
Within the UK HE there have been two major studies on ES implementations that did to a small extent explore culture (Pollock and Cornford, 2004 and Fowler and Gilfillan, 2003). Their work focused on research intensive organisations and took a strategic, higher level management view of the organisations under investigation. Insight into cultural change was limited and did not provide empirical evidence into how the culture changed over time or how it impacted the individual front line staff.

In addition, Wagner et al.'s (2006) study illustrates how a best practice ERP system was actually created for the HE sector in the USA. Their research reveals that although the creation of new software-based best practices is assumed to be a thorough, exhaustive, investigative process they may have been determined by a relatively small interest group and when considering the early progress of ES for HE this was surrounded by controversy. Sabau et al. (2009) who conducted their research in the Romania HE sector concluded that at the end of the day an ES does not provide an institution with a competitive advantage. Instead this comes from the type of services it provides to its students with an ES being a facilitator and not a driver in a university's processes. However, this integrated, whole institution approach is intended to require all parts of a university to use a standardised format and moves it towards a highly coupled centralised organisation no matter how decentralised it is and how autonomous are its faculties (Pollock and Williams 2009). The next section discusses the theoretical framework used in this research in order to gain a deeper understanding of the organisational aspects involved in an integrated IS implementation.

3 A THEORETICAL MODEL FOR THE IMPLEMENTATION OF INTEGRATED SYSTEM

Wainwright and Waring (2004) developed a model for the implementation of integrated IS based on the literature and empirical work which proposes that three major domains should be taken into consideration while implementing integrated IS. These three domains are technical, strategic and organizational. The technical domain sees integration mainly from a technical perspective but fail to recognise the importance of organizational issues. The strategic domain views integration as a way to achieve competitive advantage and mainly concentrates on strategic issues. Finally, the organizational domain concentrates on issues such as structure, power and politics, social and historical and finally cultural issues. This research is based on the work of Waring and Wainwright (2004) and by using their theoretical model (Figure 1) will specifically investigate the implementation process of an integrated IS in a HE institution. The research examines the issues of structure, power and politics, social and historical and culture in greater detail and seeks to understand how these have evolved during and after the implementation of an integrated IS in a UK university.

Figure 1: A Strategic Model for IS Integration (adapted from Wainwright and Waring, 2004)



The framework for integration by Wainwright and Waring (2004) presents a systematic framework discussing IS integration issues and stresses the need for soft (organizational and strategic) issues to be studied in a proactive manner while implementing integrated Information Systems. This is in line with this research since it seeks to gain a better understanding of the

organisational impact that the implementation of integrated IS have on an organisation.

For the purpose of this research we are focusing on the organisational domain and we therefore seek to gain a better understanding of the implementation of an integrated IS by exploring soft issues such as structural, cultural, political and power analysis as well as the social and historical context of the implementation.

4 METHODOLOGY

The study of the SITS (Strategic Information Technology Services) implementation began in 2006 as an ethnographic study after what had been a very challenging year for many of the academics at EducationCom. Ethnography can be defined as a *'style of social science writing which draws upon the writer's close observation of and involvement with people in a particular social setting and relates the words spoken and the practices observed to the overall cultural framework within which they occurred'* (Watson 2011:205). Watson (2011) argues that ethnography should involve participant observation, content analysis of documents, stories, myths, rituals, symbols and other artefacts. This may be supplemented and strengthened by interviews, statistical analysis and even small surveys. The research began with an in-depth critical analysis of the documentation leading up to the SITS implementation. This was followed during 2008 by twenty two interviews, averaging one hour each, with university staff who had been in the university for no less than five years. As in the case of Doolin and Lawrence (1998) these staff were interviewed more than once.

Interviewees were taken from the five largest faculties (Business, Arts and Humanities, Health and Education, Computing and Engineering, Design) where student business was more complex as well as staff from the postgraduate research department. A non-directive interviewing technique was used which allowed respondents to express their own views about organizational life in their own words rather than force them into predetermined categories (Hirschheim and Newman, 1991). The interviews involved a discussion of issues surrounding the participants' prior experience of student information systems, the implementation of SITS, life in the organization and change during and after SITS went live. Interviews were audio taped with permission, transcribed and returned to the interviewees for verification. Anything that was felt by the participants to be problematic was removed from the transcript and after one interview a respondent decided to wholly withdraw her transcript.

Participant observation took place throughout the research study and was recorded using a diary. As a member of staff one of the authors was able to participate in the activities which contributed to the academic role in providing student data. Working alongside other colleagues she was able to observe the action of various

individuals and interpret them in order to gain insight into the cultural manifestations of the organization (Bryman 2004). Waddington (2004) suggests that being part of day to day activities or important events can provide valuable understanding of organizational practice which can become ritualised over time. In order to understand administrative life the same author spent a number of periods of observation during peak times in the academic calendar: student enrolment in October, marks recording after assessment in February and examination board preparation time in June.

Using a general inductive approach informed by grounded theory (Crabtree and Miller 1999; King 2004) the interviews, documentation and diary data were coded according to theoretical concepts suggested by the data rather than imposed by the researcher. The approach used involved a process of developing initial categories, grouping data, identifying patterns and then making comparisons to uncover shared elements and properties (Barley 1990; Van Maanen 1979). The documentation and transcripts were also read critically to identify statements which reflected values, beliefs and assumptions about SITS as well as for evidence of organizational stories, myths and rituals which may have arisen over the period of the research.

The analysis of the case study is presented in a form of narrative taking into consideration the improvisations which took place and the elements of each circuit. Bearing these in mind the discussion explores what happened during the SITS implementation. The intention is to identify those possible elements or factors that have resulted in the system being adopted by EducationCom in the manner it has.

5 FINDINGS

It is impossible within this paper to explore the extensive rich data captured during the research process. Therefore we have focussed on data that provides insight into the implementation and how it has not just delivered an integrated administration system but also other unforeseen challenges for the organization. Nevertheless it is important to understand some of the background to the implementation and why the new system was deemed necessary.

EducationCom has always had computerised administrative systems and these have been distributed, located within academic departments and developed by academic users. Prior to 2006 EducationCom had attempted to install and use an Oracle system to undertake a centralised approach to the university administrative business. Consultations had taken place with stakeholders but these had been time consuming. The system itself was not particularly good or user friendly and in fact had caused a lot of difficulty for senior management when

trying to extract accurate data for the finance returns to Central Government. A decision was taken by the CEO of the university to abandon the Oracle system and purchase a new integrated IS, SITS. This time there was no consultation with academic staff and limited discussions with senior administrative managers. The system went live just before the autumn term started in 2006 without the general knowledge of academics which resulted in chaos for students and staff. Since then much has changed in the university and this will be discussed in greater detail below. We have grouped and presented our findings based on the organisational domain aspects of the Wainwright and Waring (2004) framework discussed above. Therefore we explored the social and historical context of the implementation, we examined the organisational structures and culture involved with the implementation as well as any power and politics issues which arose because of the introduction of the new system.

Social and Historical Context – The rise of uncertainty

The failure in implementing the Oracle system prior to SITS as well as the pressure from central government and funding bodies for more detailed statistics meant that the implementation of a 'system' was imperative. However, this led to the selection and implementation of SITS to be done in a very rushed way and a senior academic said the following:

"There was a big project prior to SITS which was Oracle, they were looking at an Oracle system which lasted for 5 years and they decided that it wouldn't work. SITS therefore was under a lot of pressure to deliver and my recollection is that it was a year for the implementation, a year looking at the project ready to implement. There was communication but the communication however, was 'this is what is happening'! Without really much opportunity to feedback so it was very much a driven project and it was not really a consultation project ... They got themselves into a mess ..." (P10, June 2008)

The implementation team had to implement the new system in a limited time frame and there was no room for delays. This had a negative impact on how people perceived the new system and because staff were not involved, they could not understand how to use or appreciate the new system. The lack of time was put forward as a major excuse for not extensively involving people from internal schools and departments. Regarding this matter the project manager said:

"I had a project team to manage and we had a very strict schedule. I think where we probably fell down was because it had to be done quick so we didn't always involve the users as much as we might have done although there were opportunities for them to get involve and people found it hard, had to commit with a lot of time and it wasn't the case where we would talk ... We had to do it there and then!" (P7, August 2008)

Most importantly the fact that SITS was implemented so quickly caused initially stress, tension and chaos across schools. Perhaps if the implementation team had spent some time to involve, inform and educate people around the university about the new system, what is suppose to do and why they need to implement it, then people might have not had such high expectations and life after SITS might have been smoother. The new system is a reality in EducationCom but there are still problems. Interviewees dealing with standard taught undergraduate programmes believe that the system is working. Nevertheless EducationCom has seen a big turnover of administrative staff since the introduction of the new system since it requires attention to detail and familiarity with a system that is not intuitive. Staff are expected to put in lots of overtime to deal with the data and for some this is a step too far. One of the interviewees left suddenly after the interview and indicated that after 26 years in post the situation was too stressful and difficult.

Also, the new system caused chaos and disorganisation to processes which was creating a lot of frustration and anger. A senior academic remembers:

"I can remember that the response to whatever you would ask the answer would be go away ... please go away come and back in a week when we will sort all of this out ... things were weird and SITS was rubbish ... SITS made things harder rather than making life easier ... people were getting angry with each other ... it was difficult at the beginning for admin staff to use the system how frustrating it was ... it was infuriating not being able to do what they wanted as quickly as they wanted". (P1, July 2008)

Although the new system should have automated the institution's processes and make things easier, it seems that in certain cases it causes extra confusion and still some processes are paper based rather than automated and more flexible. It appears that SITS is not adaptable or flexible and on top of that creates a lot of frustration to people because they do not know how the system works, thus employees blame the system since they do not know who else to blame.

Additionally, the new system hinders innovation while academics need to work around the system. It seems that although academics are trying to come up with assignment ideas which could make assessment more exciting for their students, the new system is not allowing this to happen which adds up to the frustration and negativity towards the new system. SITS created chaos, lack of innovation and **uncertainty** since administrative staff did not know how to use the new system initially. After the implementation of SITS it appears that administrators have control of how things should run and the academics are relying on administrators more than they did prior to SITS. This **makes it difficult for academics and administrators to work together** while it **changed the identity of administrators** who acquired new roles and responsibilities after SITS.

New Structures – The loss of Trust

When SITS was introduced academics could see that administration staff were not familiar with the system and therefore this led to some concerns about whether administrators knew what they were doing. This manifested itself in them beginning to keep their own records. Although academics were trying to be sympathetic to some administration staff, they were very annoyed and it was a period of increased tension. However, the culture of an organisation can determine how its members will deal with a crisis situation. EducationCom went through a crisis period and there was a lot of tension among its employees which appears to have caused not only lack of trust in the new system but also in academics and administrators.

A senior academic discusses how people do not trust SITS but also how SITS seems to be the easy target for employees to blame when things do not go as planned:

“It is the frustration that the system can be blamed for everything ... blaming the system is the best place to hide and I think that this culture is greater than this respect! Because we do need to blame something and SITS is the easiest target”. (P1, July 2008)

A senior administrator suggested that the SITS team does not seem to communicate very effectively with the schools.

“Sometimes when you are downloading information, or recording lots of students you can find that the codes have changed and that is quite annoying ... and it is only the second or third or fourth time that we realise or they decide to tell us that they have changed the codes...” (P14, June 2008)

The loss of trust between the various university staff members meant that often people were reluctant to take responsibilities and admit that something was wrong. An administrator (P2, June 2008) stated that:

“academics usually take a lot of chasing, the responsibility seems to lie on our shoulders and we are the ones who worry if the marks are not in for the exam board”.

It is clear that relationships have changed between academics and administrators – some might argue not for the better:

“it has to do with power, but it is more than that. It is the defensiveness, paranoia of being criticised and there is the habit of witch-hunting in the administration department certainly. If they admit that something needs improvement it is like saying that it was not done right before. But it is also the attitude of ‘how dare you tell me how to do my job?’” (P5, May 2008)

An administrator did say that now with SITS they are having access to more information than before. However when she was asked if that also meant that academics have access to more information the answer was that:

“they don’t have access, we do”. (P2, June 2008)

Regarding this practice an administrator claims that:

“to ensure that everything is in there and we can know what is missing and we can chase it whereas if not then it might be a problem”. (P2, June 2008)

The highly rigid structure and formal ways of operating imposed by SITS does not work for all academic schools. However, it appears that any decisions about the implementation of SITS were not internally appraised and were solely taken by the senior management of the university, without the consultation of major stakeholders. A number of schools were required to **undertake a re-structure** in order to align their work with SITS. This meant that administrators were not familiar with using SITS while academics lacked any knowledge whatsoever regarding what SITS can or cannot do. This situation led academics and administrators to **lose their trust** in SITS but also in each other since their unfamiliarity with the new system caused breaches in communication.

The evidence seems to indicate that administrators have control of SITS data and make decisions about when marks should come in, set the dates for exam boards and when the graduation should take place. They argue that the administrative burden has been lifted from academics. Yet with this has come a new authority and **political power** – much of which has bypassed many academics.

Power and Politics – The power game

The perception of senior academic staff is that none of the schools have been consulted about the new system. The Academic Registrar did point out that the schools were consulted, but the consultation was done through the administrative staff and not through the academic faculty (P11, June 2008). The main focus of an administration system such as SITS which has been implemented in a HE institution should aim to facilitate the role of an academic and not primarily that of an administrator. The academic is the one who is responsible for marks and exam boards and they are the ones that know how these tasks can be performed more effectively. Most academic research in IS would suggest that stakeholders involvement is essential and should not be put aside as happened in the case of EducationCom.

During the initial implementation an interesting finding was the fact that Academic Registry and the implementation team sent messages that SITS implementation was going very well and there were no problems. It was a kind of policy in the implementation team that either they did not acknowledge issues or they knew about them but they did not want to admit it. They were trying to convince people that SITS was going fine and that if there was a problem, then the problem is with the school, although at the end of the day every school was facing the same problems (P10, June 2008; P14, June 2008).

“... the message came back from the centre was always that SITS implementation is going well. The feedback from individual departments was that there were tremendous problems. The centre would say you were the only one complaining about this problem. But when we

talked to other departments they would say 'Oh yes we have the same problem'” (P10, June 2008)

An academic (P5, May 2008) stated that EducationCom is an extremely bureaucratic institution and that this bureaucracy existed before SITS. However, there has been a missed opportunity to improve the system. People have focused on implementing the new IS system and they have not thought about changing the human system that interfaces with it. Consequently even after implementing such a big system they still use many paper based processes e.g. for the marks entry. In fact it appears to have become even more bureaucratic.

It seems that the implementation of SITS did not improve the way things are done in the institution and rather than making an effort to change the so called bureaucracy of doing things, employees seem to continue fostering it.

A senior member of staff from the central department suggested that often academics do not treat administrators in an appropriate manner which consequently nurtures tension and rivalry in their professional contact.

“I think there has been a general culture throughout the school where I don't think academics treat administrators necessarily in a very helpful way. And I think in some ways the system supports staff views in a similar way ... There are some academics who are not prepared to give up any work because they will say I can't do that administration but then they say no you can't take that bit of administration away from me because it needs an academic to do.” (P11, June 2008)

It is interesting to see that being in an administrative position might be considered by some people as ‘the dark side’. This shows once more that administrators and academics find tensions in working with each other as a team towards a common cause for the university's benefit.

In addition, the implementation of SITS brought the introduction of the SITS helpline, and the introduction of a new role; that of the “good housekeeper” which brought to the surface a new power that of the administrators. This new role appears to have first **changed the identity** of administrators who have more **power** and second the identity of the academics. After SITS academics are required to comply with the requirements of the new system when prior to SITS academics seemed to determine what kind of systems they needed and in some cases they were the ones designing these systems. Finally, it could also be argued that **organisational politics** played a significant role in this major shift in the locus of control.

The emerging organisational culture

The assumption that SITS will make life better seems like a dream that might still need a few years to come true. The project leader did admit that the implementation was a very rushed process and goes on stating that:

“for the first two years it actually took over my life but it has made me think things in different ways and think how we can best do things with SITS to enhance the

university ... we are still doing that ... because it was a very quick implementation ...” (P7, August 2008)

SITS could perhaps make life easier for staff members but how could it improve university life when many academics do not know the capabilities of the new system as it was reported in an earlier section. Some people's perception is that life is not better with SITS since it did not deliver what it was promised and consequently it did not meet many staff expectations.

“We were told it would be an all singing and all dancing system and that it had been looked at in a number of ways and that there were a number of universities who were using this system and that there would be lots/ more facilities that would be available on this system to helps us – but there wasn't.” (P14, June 2008)

The new system was expected to improve life but most staffs' comments is that SITS did not deliver, especially at first what it suppose to deliver. This in effect drove many people to lose their trust towards the new system and their colleagues. The fact that academics were not at all involved during the SITS implementation creates communication breakdowns among staff members since academics cannot understand the system and are heavily relying on administrators. However, when SITS was first introduced administrators could not sufficiently use the system and therefore could not perform their jobs. This situation significantly affected the employees trust towards the system but also towards their fellow colleagues and increased uncertainty.

6 DISCUSSION

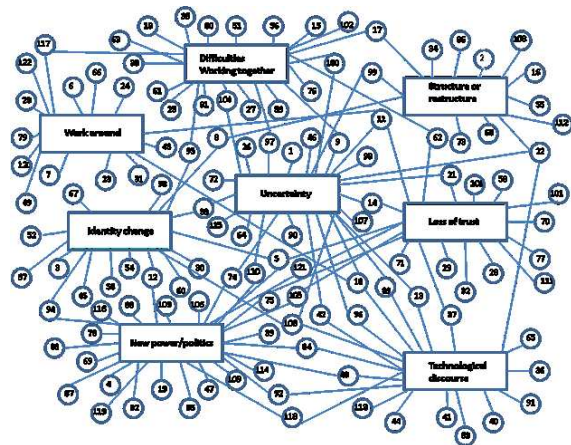
The discussion of the findings is based on the framework by Wainwright and Waring (2004). We discuss how the new system had an impact on the organisational life of the University by looking into the aspects of the social and historical context of the implementation, new structures that developed as part of the implementation, power and politics involved with the introduction of the new systems and finally how the overall culture of the HE institution was influenced by SITS.

Taking into consideration the changing HE cultural environment and the analysis of the primary data, what appears to emerge are a number of themes which are indicative of possible organisational changes within EducationCom. While analysing the transcripts the authors extracted coded texts from participants' interviews. The authors were looking for statements that show beliefs, emotions, disagreement, stories or other evidence that indicated organisational changes in relation to implementation. Each of these texts was numbered from 1 to 122, and links between them were made by identifying any similarities in these text extracts. From the coded pieces of texts extracted from the interviews, the themes became evident. The themes emerged through an iterative

interpretive process and have a number of links to corresponding themes via concepts in the text, as can be seen in Figure 2. The code text (social and historical context, structural analysis, power and politics analysis and cultural analysis) also can be linked to one or more themes as it will be discussed below.

The implementation of SITS in EducationCom seems to have caused power and political issues which appear to have altered the culture as well as the structure of the organisation. The university has also seen the rise of new groups of staff – the good housekeepers and SITS team which caused a change of identity to a number of staff members' roles. These specific bodies did not exist before SITS but now they have their own power base and have influence over what happens to academic processes within SITS. They meet regularly together as a "user group" with senior university managers but the group has no academic input. This situation also causes uncertainty and loss of trust between members of staff since communication and collaboration do not seem to be encouraged. Another impact of SITS is that the new system is not appropriate for all departments and schools which consequently either creates problems for members of *staff in working together* and leads them in finding *ways to work around the system* in order to be able to perform their roles and responsibilities. This incompatibility of SITS might also have caused the *structure and re-structure* of schools and departments; while it encourages a *technological discourse* which does not necessarily help in smoothing the relationship between academics and administrators.

Figure 2: Emergent themes in EducationCom



Social and Historical Context – The rise of uncertainty

From the outset of the project it was not clear to academics why they were not involved during the implementation of SITS. This caused uncertainty to the academic members of staff since they were not sure how the new system will affect their jobs. Administrators are the sole users of SITS which often makes academics uncertain what can or cannot be done, thus relying heavily

on administrators for tasks that prior to SITS was performed equally by academics and administrators.

Administrators are very territorial about SITS and very reluctant for academics to get involved with the new system, which makes collaboration among members of staff very difficult. Agee and Holisky (2003) suggest that the key to highly effective organisations is to build relationships while they also argue that successful collaboration opens up new possibilities for achievements that are not available when people are working alone. Unfortunately, administrators and academics seem not to collaborate anymore which increases tension and uncertainty between these two main stakeholders.

Another issue that increased uncertainty was the fact that no proper training was given to the end. Although training is an issue frequently mentioned in the IS field (Gupta, 2000) as a major contributing factor when a new information system is implemented, and everybody is aware of its significance and necessity, EducationCom is another example where the implementation team underestimated the importance of training the right people. Therefore employees, in particular administrative staff, were not sure about the role they will play after the implementation of SITS or how their role might change. Members of staff were also uncertain regarding what they need to do if something went wrong with the system or who might be in charge of the new system.

New Structures – The loss of Trust

Writing in the early 1980s Dill (1982) foresaw that the strength of the academic culture is declining and almost thirty years later it appears that he was right. Considering the academics' position after the implementation of SITS in the EducationCom case study it can perhaps be argued that the influence of the academics is at its lowest' with administrators holding major control of university processes and policies around academic programmes. This might have occurred because academics were neither involved during the implementation of SITS, nor been given access or training to use SITS.

Similarly, Noble (1998) argues that rather than providing academics with greater freedom and control over their work, the introduction of network technology into universities has instead contributed to the commoditisation of education. With the introduction of new technologies the role of academics is being restructured, via the technology, in order to reduce their autonomy, independence and control over their work and to place workplace knowledge and control as much as possible into the hands of the administration (Noble, 1998, p. 7).

In the case of EducationCom the identity of the academic and the administrator has significantly changed. More specifically, SITS has enabled the reconstitution of formal management structures and processes within the university and has led to identity change with some groups of staff being winners and others possibly losers. These

groups are the central finance department, the registry department, academics and administrators.

Power and Politics – The power game

Power relations have been strongly impacted and in some cases completely reversed. In a university whose core competence is education it can be seen that administrators and administrative managers are now determining policies, procedures and by implication the strategy of the university (Harrington, 2008; McFarlane, 2005). This is at the expense of academics. Administrators decide on the academic calendar, recruitment criteria (now an automated points based system), examination boards, quality audit, staff performance management, to name but a few. Many of these areas used to be under the direct control of the academic faculty members and the head of department.

Additionally, the literature suggests that information systems implementations should be seen as cultural shifts and the different stakeholders involved in the project should realise that the new system is not a co-mingling of people but an appreciation and combination of cultures (Agee and Holisky, 2003; Ayers, 2004; Cramer and Pfeiffer, 2002). Nevertheless, in EducationCom they excluded the academic culture from the implementation causing a lot of tension, mistrust between academics and administrators and consequently difficulties for them in working together. For example academics must provide long lead times to get information from SITS that is not in a standard format. There are long lead times to get new programmes up and running. Academics cannot develop new degrees easily or innovative ways of running them because the system struggles to cope. In particular certain senior administrators it appears are assuming authority they never had before and they are using it on academics which consequently cause problems and difficulties in working relationships.

One of the most pertinent findings of Fowler and Gilfillan (2003) which was also apparent in EducationCom is that an informal network often evolves to “get things done” outside of the formal role and responsibility structure in institutions where an ERP system was implemented. According to Martin (2002) informal practices often take the form of social rules and reveal an inconsistency between what is formally required and what actually happens. Formal and Informal practices are often the primary focus of attention in organisational research because they can provide the researcher rich insights on how things are done in an organisation.

The emerging organisational culture

“Man is an animal suspended in webs of significance he himself has spun, I take culture to be those webs and the analysis of it to be therefore not an experimental science in search of law but an interpretive one in search of meaning”. (Geertz, 1973:5)

According to this definition the objective of this research is not to analyse the impact of integrated IS on organisations in order to develop rules or a framework,

rather its main aim is to gain a better understanding and “search for the meaning” of the impact that integrated IS can have from an organisational perspective in a HE context.

It is often evident that beliefs and values that might be shared most keenly by individuals and groups within an institution may not be those most equally supported by the institution itself. Ali et al. (2008) claim that when there is a focus in analysing an institution’s culture the interpretations generally have a theoretical and observational basis, but only rarely encompass the perceptions of the actors themselves. They suggest that Becher’s (1989) research is perhaps the only exception. Becher (1989) conducted early research in Britain and focused his study on the various departments in an academic institution, in order to identify their central beliefs and values. Pursuing the “cultural identity” of groups, he examined their features and those of the knowledge territory they inhabit. He found that the characteristics of the various departments were parallel within as well as between departments (Becher, 1989).

This research found that there is a gap between the various departments and schools, even between the various roles (academics, administrators and central departments) and that their differences are greater than their similarities. For example, it appeared from the comments of some of the administrators that SITS provides them with more power and control over academics. Since academics were not involved during implementation and are not aware of how to use the system, they are therefore fully reliant on the administrators.

The implementation of a complex IS such as SITS can have a major impact on an organisation and it was evident in EducationCom that there was some miscommunication between the SITS team and the academic schools in that they wanted the SITS implementation to be seen as running smoothly. Also they tried to blame the problem faced by the implementation team on individual schools’ use of the system rather than take responsibility for the faults of the system. Although SITS was seen as a solution to the increasing numbers of students and demands of government reporting the new system seems to have caused more problems than it actually solved. Prior research on the implementation of integrated IS in academia has reported that systems such as ERP systems have helped universities to realise a number of advantages (e.g Cornford and Pollock, 2003). However, this might not always be the case because the HE sector environment is a complex one and in constant flux.

The study by Cornford and Pollock (2003) discusses a SAP ERP implementation in an old university where they identify a number of advantages that universities can gain by using integrated information systems. They suggest that an ERP system can enable academics, researchers and administrators to deal more effectively with the rising numbers of home as well as international students. An

integrated university is seen as a strategy for coping with the increasingly diverse student body and to enable the university to respond more effectively to new global markets and to meet the requirements of increasingly onerous national regulations (Cornford and Pollock, 2003). Additionally, there are pressures concerning the increasing demand for universities to show greater responsiveness to the needs of business and the wider community; therefore when a university manages to integrate its processes it can smoothly interact with the whole range of regional stakeholders (Cornford and Pollock, 2003). Although the new system was introduced in EducationCom mainly to satisfy the HESA requirements however, it appears that it caused more problems than it actually solved as it was discussed in the previous sections.

From a more critical perspective Fowler and Gilfillan (2003) identified a number of issues that can arise during the ERP implementation in HE. Business process analysis; design and standardization; cultural issues; project planning and control issues; staff support for the projects; motivation; the decision process; and IS strategy were some of the main issues that seem to be regarded as very important during ERP implementation in the HE sector. However, no further insights were offered for these factors and therefore the research presented here attempted to gain a better understanding of the organisational issues. Fowler and Gilfillan (2003) also attempted to develop a framework which would aid institutions to improve the implementation and development of large and complex ERP type information systems. The main outcome was an IS project management framework providing general guidance and a bridge for cooperation between the very diverse stakeholder groups involved in IS implementations. They identified that these different stakeholders include senior university management, project team and system vendors. However they omitted the views of the two most important stakeholders forming any HE institution, academics and administrators. Thus, this research attempted to gather the views and beliefs of academics, administrators, central department and the SITS team. Actively involving the various stakeholders is an important factor that needs to be considered during integrated systems research because in order to fully understand the organisational issues it is necessary to understand the individuals who interface with the system and hence the various cultures and sub-cultures within the organisation (Schein, 1992; Thomsett, 1993). Therefore by studying the various cultures that exist in an organisation is a way to understand both the foundation of a group with a distinctive identity (such as the HE sector) and the fundamental grounds upon which groups differentiate or distinguish themselves from each other. The introduction of a major organisational change such as SITS can affect unanticipated change that may not be for the best as it was evident in the case of EducationCom.

Finally, a research by Elbanna (2007) re-inforces what many IS academics have known for a long-time that implementing integrated information systems requires the involvement of all relevant end-users in an organisation. The research invites practitioners to reconsider the view that the technical integration capability of ERP is straight forward and instead, they should be open to examining the roles of all actors with the power to influence not only the implementation project but also the system being implemented (Elbanna, 2007). The research conducted here recognises this and the participants of this study were from various levels and roles in the organisation under scrutiny, which enabled the researcher to gain a wider picture of how the implementation took place as well as how the new system influenced the operations/processes of the academic institution. EducationCom did not involve many of its constituent members in the implementation and hence their concerns were not explored in any detail.

7 CONCLUSIONS

This research has followed a fairly structured approach and tried to be more analytical in order to make sense of the impact that integrated IS such as SITS can have on an institution's culture.

This work has sign-posted important issues that have implications for all organisations that choose to embark upon an integrated IS implementation without considering the consequences. More specifically at EducationCom a HE institution there has been a re-constitution of management which has reified the SITS system and subjugated all other forms of management. The new management agenda has become firmly cemented within the new technology which has then become an agent and an enforcer of strict instrumental policy and power. This has enabled a significant power shift to central non-academic departments at the expense of academics who directly support the core competence of the University, teaching and research, without which the university would fail. Academics become wedded to formal inflexible processes and form filling and are unable to think outside the "black box" which is SITS. Well qualified and experienced administrators fight on a daily basis to enter data into a system that is unfriendly and non-intuitive, relying on an elite group of staff (Good housekeepers) to solve their problems.

The themes identified in this research can be further explored in the context of another HE institution in order to examine whether the same themes apply or if there are more themes to be added. Additionally each of the themes identified can be explored in more detail in a different context and from a different perspective. For example, our interpretations being academics might differ if an administrator or a member of the academic registry or a SITS expert was conducting the same research.

Finally, through the use of Wainwright's and Waring's (2004) framework it was found that EducationCom experienced major organisational and more specifically cultural changes throughout the institution. However, the framework refers to cultural analysis in general without explaining how integrated IS have an impact on the organisational culture. Thus, this will be the topic of our further research which will shed more light into the impact that integrated information systems have specifically on an organisation's culture.

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