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THROUGH THE KALEIDOSCOPE: PERSPECTIVES ON CULTURAL CHANGE WITHIN AN INTEGRATED INFORMATION SYSTEMS ENVIRONMENT

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Abstract

Although many authors have 'studied' culture within the context of IS/IT there are few examples of academic research which have developed approaches that reflect the dynamic and complex nature of organisations undertaking integrated systems implementations. Those that have, have tended to focus on corporate culture and have paid little attention to the micro-cultures or in fact the lack of culture within the organisation. Studies which take a more inclusive approach require call for longitudinal studies of an ethnographic nature as well as an understanding that cultural change is an emergent process that cannot be undertaken as a snapshot in time. The aim of this paper is to illustrate how this has been done using a three year study of an integrated information systems implementation, the Strategic Information Technology Services (SITS). It develops the concept of the 'cultural kaleidoscope' to provide insight into the changing nature of culture within organisations and the multiple perspectives of those stakeholders affected by the implementation.

Keywords: Culture, Integrated Information Systems, Higher Education

1. Introduction

One of the challenges that Information Systems (IS) academics have been addressing is to develop better theoretical understanding of organisational issues within the context of IS implementations. Much of the work that has been done in this area has been through multi-variate statistical hypothesis testing research which reflects a cross-sectional approach and a snapshot of data at one point in time (Lee, 2010:341). Although not decrying this approach Lee goes on to argue that the IS discipline

cannot continue to rely on this approach alone and must adopt other relevant research methods along with appropriate theory development to reflect the subjective, dynamic nature of organisations.

The study of culture and its relationship to IS and IT is an area of organisational research that has recently been the subject of much theorising (Kayworth and Leidner, 2006; Gallivan and Srite 2005; Kappos and Rivard, 2008). The authors' work based on extensive literature reviews has produced mixed results and little agreement. This should not be surprising as the study of culture within the anthropology and organisational behaviour literature is highly contested, complex and with a number of epistemological perspectives (Hatch, 1997). Systematic literature reviews are a vital component of all research strategies but should not be the only approach.

We argue that although many authors have 'studied' culture within the context of IS/IT there are few examples of academic research which have developed approaches that reflect the dynamic and complex nature of organisations undertaking integrated systems implementations. Those that have (Doherty and Perry, 2001; Doherty and Doig, 2003) have tended to focus on corporate culture and have paid little attention to the micro-cultures or in fact the lack of culture within the organisation. Studies which take a more inclusive approach require call for longitudinal studies of an ethnographic nature as well as an understanding that cultural change is an emergent process that cannot be undertaken as a snapshot in time (Gallivan and Srite, 2005). The aim of this paper is to illustrate how this has been done using a three year study of an integrated information systems implementation, the Strategic Information Technology Services (SITS). It develops the concept of the 'cultural kaleidoscope' to provide insight into the changing nature of culture within organisations and the multiple perspectives of those stakeholders affected by the implementation. The next section explores some of the 'taken for granted terminology' uncritically used within IS and pertinent to this study before reviewing the contributing literature to the IS culture debate.

2. Integrated Information Systems and SITS

Lee (2010) has pointed to the problematic nature of IS research when terminology is taken for granted. He argues that even the definition of a generic IS is contested and offers an interpretation which identifies three dynamic, interacting aspects of an IS –

‘the technology system’, ‘the data system’ and ‘the organisation system’ which emerge over time. Further complexity arises when considering integrated IS. This has been interpreted by a variety of academics from different perspectives and once again there is no one accepted definition of integration. These interpretations have been comprehensively discussed by Wainwright and Waring (2004) and have been classified into four domains of integration. The technical domain is very dominant in the fields of computer science and IS and integration is seen as a goal to make complex software and hardware artefacts communicate using appropriate protocols, conventions and technologies. The systems domain encompasses approaches to integration that provide a greater holistic perspective or which have a philosophy underpinned by general systems theory. Below (1987:17) differentiates integration from interfacing:

“integrated systems cannot be taken apart without destroying them... whereas an interfaced system consists of parts which are replaceable and which are clearly individual...”

A number of authors have argued that integration is also a strategic issue and any definition should have a strategic component (Voss, 1989; Platts, 1995). Hence a strategic domain can be identified and is typified by the drive to develop and implement large scale Enterprise Resource Planning (ERP) systems and e-business (Porter, 2001). The focus of the strategic domain has been on integrating business strategy with IT/IS strategy and this has resulted in a plethora of planning methods, tools and techniques (Robson, 1997; Ward and Peppard, 2002). The organisational domain is acknowledged to be extremely important for integration of information systems. However, this domain is very difficult to define as each implementation is unique to its context. It involves the integration of people, their ideas, their methods of working, interpersonal relationships and decision making processes all of which may be highly subjective. It can involve tangible issues such as structure (Walsham, 1993; Orlikowski and Robey, 1991) but equally it encompasses the social and historical situation, organisational power and politics (Markus, 1983) as well as culture (Pliskin, 1993; Dubé and Robey, 1999; Waring and Wainwright, 2002; Wagner and Newell, 2004).

Over the last 20 years many off the shelf technically integrated IS have emerged – ERP, CRM, supply chain systems, computer integrated manufacturing to name but a few. Even within the Higher Education (HE) environment systems technical integration has been on the agenda. An example of an HE integrated information system is SITS (Strategic Information Technology Services) and is used by over 60% of the UK HE market and 25% of the Scottish Further Education (FE). It has become the de facto standard within the UK HE sector and is gaining ground in Europe market (<http://www.qas.co.uk/partners/tribal-8.htm> accessed 26/02/2010). Like many other integrated information systems of its genre it has been built around an ‘ideal’ model of university administration and consists of modules to support admission of students to university, programmes to manage the curriculum, a student module to manage enrolment, fees, progression throughout the degree and tools to ‘enable’ users to analyse, process and extract data to suit their purposes. The issue for SITS adopters is to understand how such a demanding and tightly coupled ‘technology system’ and ‘data system’ will interact with the ‘organisation system’. The organisation has requirements and these are not just around data and technology. Utilising technology which is all encompassing and infiltrates every aspect of University business may have a substantial affect on its culture and its ability to be innovative and flexible going forward (Ogbonna and Wilkinson, 2003).

3. Culture and Integrated Information Systems

The study of culture has its roots in anthropology, has been based on groups or tribes and has been a growing subject of study in sociology, business and management as well as IS. Yet what is meant by ‘the study of culture’? There is no consensus as to the approach taken within the extensive body of literature and this is reflected in the numerous definitions of culture (e.g. Geertz 1973:5; Smircich, 1983:344; Sathe, 1985:255; Kotter and Heskett, 1992: 141; Reeves and Baden, 2000:4). This is further complicated when extended to ‘organisational culture’ as new definitions emerge (e.g. Schwartz and Davis, 1981:33; Kilman (1982:11; Schein, 1984:3; Lawrence and Lorsch (1986:84; Martin, 1992:3). Summarising much of this work Harman (1993: 34) suggests that “*culture is typically applied to organisations to mean the shared beliefs, myths, ideologies and other forms of expressive symbolism which serves as a*

normative guide for members' behaviour...". However Martin (1992:3) expresses this differently:

"... individuals come into contact with organisations, they come into contact with dress norms, stories people tell about what goes on, the organisation's formal rules and procedures, its informal codes of behaviour, rituals, tasks, pay systems, jargon and jokes only understood by insiders, and so on. These elements are some of the manifestations of organisational culture. When cultural members interpret the meanings of these manifestations, their perceptions, memories, beliefs, experiences, values will vary, so interpretations will differ – even of the same phenomenon. The patterns or configurations of their interpretations and the ways they are enacted constitute culture."

Much of the early research into organisational culture conceptualised culture as a variable that can be controlled or manipulated and has led to prescriptive approaches to culture research (Knights and Willmott, 2007; Huczynski and Buchanan, 2007; Ouchi, 1981; Peters and Waterman, 1982; Deal and Kennedy, 1982). However, Meek (1988) and Smircich (1983) view organisational culture not as something the organisation 'has' but 'is': culture is more complex, a product of many factors including history, the environment as well individuals' backgrounds and their view is that researchers do not seek to discover culture but to interpret it. As the popularity of organisational culture grew so did academic interest in the role of culture in organisations (e.g. Schein, 1984; Lawrence and Lorsch, 1986; Morgan, 1986; Pettigrew, 1985; Hofstede et al., 1990; Meyerson and Martin, 1987; Agee and Holisky, 2003; Cramer and Pfeiffer, 2002). This has been mirrored in the IS field (e.g. Avison and Myers, 1995; Pliskin et al., 1993; Robey and Azevedo, 1994; Straub, 1994; Dube and Robey, 1999; Fowler and Gilfillan, 2003; Wagner and Newell, 2004; Gallivan and Srite, 2005; Boersma and Kingma, 2005; Leidner and Kayworth, 2006; Kappos and Rivard, 2008).

It is clear when one considers the extensive literature reviews conducted by Gallivan and Srite (2005); Leidner and Kayworth (2006) and Kappos and Rivard (2008) that IS research faces many of the dilemmas that have arisen in studies of culture within the Organisational Behaviour field. Is culture defined and studied from a positivist, interpretivist, critical or post-modern perspective and which framework or analysis tools should then be used? Should researchers look for regular or symbolic 'laws' and

not for the ‘intricacies of meaning’ as Robey and Azavedo (1994) suggest or should they see culture as being understood differently by different users depending on their specific beliefs, assumptions and values – they ‘*socially construct*’ the technology and hence ‘*their patterns of behaviour in idiosyncratic ways may change over time*’ (Gallivan and Srite, 2005: 324)?

Essentially determining ones epistemological understanding of culture will determine how it should be studied and analysed. Much of the early cultural analysis research was from a positivist perspective and is typified by Hofstede’s (1980) work on national culture and Schein’s (1984, 1991) studies of organisational culture. These two streams are reflected in the IS literature and commented upon by Gallivan and Srite (2005) who argue that they should be merged to provide a more holistic theory of IT and culture. From a post-modern interpretivist perspective researchers (Martin, 1992, Brown, 1998, Hatch, 1997) have argued that frameworks are unhelpful and cultural manifestations within the organisation may provide better insight into the nature of culture and change. These are shown in Table 1:

Manifestations/ Artefacts of Organisational Culture	
Category	Example
Formal and Informal Practices	Formal practices – written policies, formal structures, technology use, rules, controls
	Informal practices – custom, alternative procedures not written down.
Physical Manifestations	Art/Design/Logo
	Building Decor
	Dress/Appearance
	Material Objects
	Physical Layout
Behavioural Manifestations	Ceremonies/Rituals
	Communication Pattern
	Traditions/Customs
	Rewards/Punishments
Verbal Manifestations	Anecdotes/Jokes
	Jargon/Names
	Explanations
	Stories/Myths/History
	Heroes/Villains
	Metaphors

Table 1: Artefacts of Organisational Culture adapted from Hatch (1997:216)

Nevertheless a further complication can be seen when considering the concept of ‘organisation’ and the level of analysis. Should researchers only explore the culture at the holistic, corporate level or should they consider the sub-groups and individuals who constitute the organisation? Meyerson and Martin (1987) recognised this dilemma very early in their research and proposed a three perspectives view of organisational cultural studies. These are summarised in Table 2:

Perspective	Understanding
Integration	<p>Culture according to this perspective is an integrating mechanism, it is the shared values etc of a given group or organisation. The term ‘shared’ helps identify relevant manifestations of a culture – a common language, shared values or an agreed set of appropriate behaviours. 3 characteristics are central to all of these studies of culture:</p> <ul style="list-style-type: none"> • Consistency across cultural manifestations -focuses only on manifestations that are consistent with each other. • Consensus among cultural members - tends to assume that cultural members drawn from various levels and divisions of an organisational hierarchy share a similar viewpoint • A focus on leaders as culture creators - focus on a leader or leadership as the primary source of cultural content.
Differentiation	<p>Instead of a focus on homogeneity this perspective on culture is characterised by differentiation and diversity. Researchers within this perspective pay attention to inconsistencies, lack of consensus and non-leader centric sources of cultural content. This approach emphasises the importance of sub-cultures including groups and individuals who may represent constituencies based within and outside the organisation. It is an open system influenced by aspects from outside and inside the organisation. It tends to emphasise disagreement rather than consensus and acknowledges that complex organisations reflect broader societal cultures and contain elements of occupational, hierarchical, class, racial, ethnic and gender-based identifications – subcultures.</p>
Ambiguity (Fragmentation)	<p>Rather than denying ambiguity (integration) or channelling it (differentiation) this 3rd perspective accepts it. Complexity and lack of clarity could be accepted and made the focus of attention. From a Fragmentation perspective irreconcilable interpretations are simultaneously entertained; paradoxes embraced. A Fragmentation perspective would have no shared, integrated set of values – except an awareness of ambiguity itself.</p> <p>Ambiguity is thought of as the way things are, as the ‘truth’ not as a temporary state awaiting the discovery of ‘truth’ – Integration is viewed as over-simplification. Consistency and consensus are considered abstract illusions created by management for the purposes of control.</p> <p>A Fragmentation portrayal of culture cannot be characterised as generally harmonious or full of conflict. Instead individuals share some viewpoints, disagree about some and are ignorant of or indifferent to others. Consensus, dissensus and confusion co-exist, making it difficult to draw cultural and sub-cultural boundaries.</p>

Table 2: The Three Perspectives of Cultural Analysis (adapted from Meyerson and Martin, 1987: 623- 647)

Within the IS field most culture research has been conducted from an integration perspective (Kappos and Rivard, 2008) and has focussed on corporate culture. However, some authors (Dubé and Robey, 1999; Wagner and Newell, 2004) have strived to better understand the three perspectives approach and have applied it within an information systems environment once again with interesting but mixed results. Nevertheless we believe that their approach has merit and should be pursued further as we demonstrate later in the paper.

Thus summarising researchers who study IT and its relationship to culture must explicitly consider a number of issues:

1. The epistemological stance of the study
2. The levels of analysis
3. The role of the Information System – artefact or cultural proxy?

The first two issues have been discussed but point three requires further consideration. Many researchers would consider an information system part of the formal procedures and structure of the organisation. It would not be seen as a variable even in the most positivist of studies (Lee, 2010). However, it is our contention that integrated information systems as typified by SITS have a ‘culture by proxy’ that has been embedded into its formal structure and operating procedures by those that designed it around the ‘model of best practice’. Thus it comes with its own jargon, coding system, rules, data and technical requirements that need to be addressed by the adopting organisation. It is also endowed with the values and beliefs of those developers of the system and added to by co-operating stakeholders such as ‘beta testers’. These values and beliefs may have been developed in another country such as the USA by individuals who have little experience of the adopting environment. This provides cultural tensions at the interface of the technology and the organisation and within the organisation itself which are difficult to understand, anticipate or conceptualise using current theories. They also change over time and are dynamic as organisational actors leave, develop new roles, become accustomed to the system, develop new systems etc.

Thus having developed an understanding of the complex nature of integrated information systems and culture research the paper considers the approach taken to

the longitudinal ethnographic study in a UK university which undertook an implementation of SITS and how it has led us to conceptualise culture change within the integrated IS environment through the metaphor of the kaleidoscope.

4. The Research Strategy

According to Remenyi et al. (1998) one of the most frequently used strategies to examine research questions in business, management and IS research is the case study approach. Case study research is a broad concept and evidence is collected in a variety of ways, ranging from structured interviews to active participation with the subjects being studied (Remenyi et al., 1998). The greatest advantage of using case study is the opportunity to provide a comprehensive understanding of the issues under investigation. Case studies can be used in different types of research such as when using a 'positivist stance' (Yin, 2003; Benbasat et al., 1987) or 'interpretivist stance' (Walsham, 1993). It can be used in many types of research for instance exploration, theory building or testing, and theory extension or refinement (Voss et al., 2002). Marshall and Rossman (2006) argue that studies focusing on society and culture in a group, programme or an organisation typically espouse some form of case study as a strategy. As Bryman and Bell (2007) observe, case study research is concerned with the complexity and particular nature of the case in question. Furthermore, Klein and Myers (1999) state that case study research is accepted as a valid research strategy within the IS research community. The organization used in this study is New University, a large post 1992 institution located in the United Kingdom. The research described here is part of a longitudinal, interpretivist case study which started in 2006 (Walsham, 2006; Bryman, 2004) and takes the perspective that culture is something an organisation 'is' not something it 'has' (Parker, 2000).

Data collection involved a number of different methods including document analysis, participant observation, story-telling and interviews. Within this case study the researchers were fortunate to have access to documentation dating back to 2005 when the concept of integration was first developed. This documentation included minutes and papers from senior management meetings, project boards, SITS user group meetings, user documentation as well as vendor and coding documentation. The data used in this paper was mainly collected during 2007/8 but does refer to earlier documented data as well as recent data collected during an academic quality audit

organization. The research team developed a series of semi-structured questions that were used during the early interviewing process and these were revised and refined in an iterative manner as further interviews were conducted. A total of 22 long serving organisational participants were interviewed. We interviewed senior academics, academics who were involved in managing degree programmes, senior administrators such as registrars as well as junior administrators who worked on a daily basis with SITS. We interviewed the SITS project manager as well as some of the technical staff involved in the implementation. The interviewees were chosen based on the post they held and the department they came from as it was important to ensure there was a balanced representation from across the whole University. After the interviews had been transcribed the researchers used Template Analysis to make sense of the data (King, 2004; Waring and Wainwright, 2008). The analysis of the data focuses on the emergent cultural manifestations as seen within New University.

4.1 Background to the study

In order to understand how SITS became central to the University it is important to reflect a little on the history of New University and explore the rationale for the integrated approach. New University is an HE institution which became a University in 1992. It began life as a college offering a variety of vocational courses and then went on to become a polytechnic managed by the local authority. The bureaucracy of the local authority management was replaced by another hierarchical system of university governance in 1992 and this has continued to grow over the last eighteen years. In 2008 it was reported that New University had approximately twenty thousand undergraduate students from which fifteen thousand were full time students and the remainder part time. New University prides itself on its use of IT to support all aspects of student and university life. However, in the early days this was not the case. On becoming a University there were a few computers used to administer the core business and none for student use. Once PCs became available it was academics who took the lead in developing small systems to support the administration of degree programmes.

“When I first started here I was deputy course leader for degree X. I had to develop a spreadsheet for the exam board that held all of the students’ marks. The administrator for the course didn’t have a clue. I put in all of the formula and was responsible for

the results at the end of the board. Marks were frequently changed after discussions.”
(Academic1, Business)

However, towards the end of the 1990s with the growth in student numbers larger systems developed by skilled academics began to emerge. There was one system for student information, known as the Student Administration System (SAS), a separate system for programmes and modules, the Academic Programme Database (APD) and a third system for capturing marks, the Marks Recording System (MRS). The SAS held the student personal details, the programme they were on and what modules they were taking. The MRS held students details, the programme that they were on, the modules that they were taking and their best marks for each of the modules. The third system, the APD held all of the programme information, the modules that formed that formed the basis of the degree and behind that were the module descriptors. However, none of those systems were integrated. It is clear from reading university documents and talking to senior managers that it was changes in the funding mechanisms and increasing accountability to the UK Government as well as the growing volume of student data which was instrumental in driving the senior management of New University to try and capture all of the student information in one system. The first attempt at integration occurred when the university purchased an Oracle system. Academics were involved as stakeholders in the initial consultations. However, this was abandoned after a period of time due to its complexity and lack of expertise in the organisation.

The decision to purchase SITS was shrouded in mystery and taken by senior managers. Very few stakeholders were involved and significantly there was no academic input into the process. The implementation proceeded with the support of a SITS team many of whom were recruited external to the University. SITS went live on the first day of the Autumn term 2006 just as classes began. It was chaos and this has acted as a catalyst to accelerate cultural change in the university.

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 cultural challenges for the organization that they had not foreseen or

even contemplated. Themes which emerged during the research process are shown in Figure 2 and these have been derived from interview text and stories told by participants. Themes are interlinked and demonstrate the complexity of studying culture as well as the impact the implementation has had on the organisation and it is these themes which we intend to explore further.

Figure 1: Emergent themes in the study

5.1 Difficulties working together

It appears that prior to the SITS implementation academics worked well with the administrators in their departments. Post SITS the situation changed. Communication across the institution was poor at the time it went live and many people were not informed of the implementation of SITS. Academics were excluded from any input to the new system and relied on administrators to keep them informed. Consequently with selective participation and limited collaboration staff priorities were inconsistent across the whole institution. A new team ‘the SITS team’ orchestrated everything at

the start of the project from a locked room and gave no access to individuals from departments. This situation led to frustration, tension and disagreements.

- ***SITS is too complicated:*** Many administrative jobs now focus on SITS and therefore administrators can be seen as ‘serving’ the system and not the academics. At the same time administrators demand academic members of staff to conform to their processes determined by SITS e.g. marks recording which often conflicts with the way that academics want to work. It was also evident that regardless of the position that an employee might have held in the institution, the organisational members, rather than working as a team trying to overcome the difficulties and find solutions to their problems, were abdicating responsibilities and were blaming each other. This ‘blame culture’ continues today, is typical around SITS issues but has been extended to many activities which involve academics and administrators. Again SITS might not be held fully responsible for this situation but it has not made things easier.
- ***Academics excluded:*** 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). The exclusion of academics from the implementation has led to many questioned processes being set up around SITS. Academics cannot access the system independently and must provide long lead times to get none standard information from SITS. SITS data structures do not easily facilitate innovation in new degree developments and this is being translated by some administrators into means of controlling academic authority.
- ***Deterioration of relationships:*** This has been significant since the implementation of SITS. Teams are now constituted within either administration or within the academic programme and subject management. In the past there would be more emphasis on multi-functional teams working jointly. This has become institutionalised where the lines of reporting are very separate, staff do not really engage together in social activities and there is a great deal of ‘watching your back’. This sometimes leads employees to work around the system in order to be able to undertake their roles and responsibilities as it will be discussed in the next section.

5.2 Working around the system

One of the most pertinent findings of Fowler and Gilfillan (2003) which was also apparent in New University 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 the culture of an organisation:

- ***Lack of innovation because of SITS:*** In New University innovation seems to be more difficult to achieve when SITS is found to be inflexible. Some of the most creative innovators – both academic and administrative have left the institution due to frustration over obstacles to promoting new ideas and practices. However, this inflexibility has also resulted in user led innovations that can work around SITS. These are tolerated but not encouraged as a formal part of the systems. For example schools have unofficial databases to deal with placements, block teaching etc. Additionally, there is the development of an external system which operates outside SITS and was designed because some academics are not satisfied with the current situation of not having adequate and accurate student data.
- ***Lack of integration of SITS with other systems:*** Due to lack of integration of SITS with other systems such as Blackboard (the virtual learning environment) and Timetabling it meant that New University's staff and students were assigned the wrong modules and were in the wrong rooms. This was one of the reasons why members of staff were forced to find ways around the system in order to get the information they need for performing their roles and responsibilities. It resulted in staff keeping their own records using local databases and spreadsheets. This is still causing difficulties.

5.3 Uncertainty

Throughout the data collection and discussion regarding the period before and after SITS it was evident that the research participants suffered a great deal of uncertainty that still persists today. This can be seen through their verbal manifestations such as stories:

- ***Uncertainty around why the system was needed:*** As there was lack of consultation on the purchase of SITS many staff interviewed questioned its effectiveness and its necessity for the university. Academic staff who had been responsible for the earlier departmental systems were excluded from the process and their systems removed from the university network thus alienating them further.
- ***Uncertainty about the training:*** Research participants discussed issues around training. Certain staff were selected to be trained on SITS and then were expected to act as local 'experts' within their departments. This led to anxiety as many had only basic skills and some staff found that the new systems did not fit their processes or their academic programmes and did not know what to do about it.
- ***Uncertainty about whether the system was working properly:*** A major uncertainty that academics now have is the quality and accuracy of exam board reports. The system uses algorithms to determine student results and

these seem to be inaccurate at times. Academic staff no longer have access to SITS and thus are relying on administrators to ensure that data is input correctly and that the calculations for their degree outcomes are also correct.

5.4 Loss of Trust

Trust is an important concept in every type of relationship and is thus equally important in a professional environment between members of staff in an organisation. Unfortunately trust within New University has diminished over the last four years as behavioural manifestations of culture would suggest.

- ***Academics were not involved in initial SITS discussions and implementation:*** For whatever reason the academics were excluded from the stakeholder consultations when SITS was being purchased. They were also not informed about the changeover to the new system until it was going live. The disruptions it caused impacted upon the staff/ student relationships and led to the academics losing trust in the organisation and the new system.
- ***Academics do not have access to SITS:*** Before SITS was implemented academics and administrators had good working relationships and they both had access to the student administrative systems. Now only administrators are allowed to use it. Also during the first year of SITS use due to the poor quality of student data and exam board reports, academics lost faith both in the system and the administrators ability to fulfil their roles and responsibilities.
- ***Academics not allowed to enter marks:*** The process for getting marks into the SITS system is protracted and inefficient. Although SITS does have an interface to allow direct entering of data such as exam marks the university does not use it. Instead academics have to submit marks on paper which are then entered into SITS by the administrators who then print them out to be signed off by the academics. Academics see this as a lack of trust and administrators view it as guarding against ‘irresponsible academics’ (villains).

5.5 Identity change

In the case of New University the identity of the academic and 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.

- ***Central finance department and Registry department.*** Staff in the central finance department no longer have to disaggregate and reconstitute figures to fit the governments requirements as SITS automates this process as a by product of data collection. This has created more opportunities to focus on achieving tighter levels of financial reporting and control within the university both centrally and across School/Faculty level. Also the university Registry department have now centralised the control of academic programme modules,

timetables, student data and academic quality control within one growing department. They have been able to expand their portfolio of services and staff and increasingly dictate quality standards and performance targets to the university departments.

- ***Academics and Administrators.*** Life is not so good for other stakeholders such as academics and some administrators who have been deskilled, becoming data entry clerks. On the other hand the administrators who have developed advanced SITS skills and have become '*good housekeepers*' (heroes to some) hold more control and power than before. This means that many administrators have moved from having a supporting role to a leading role, deciding on academic calendar dates and guarding the information that is held by SITS. However, academics have little input into the new working processes and decision making activities within degree progression and awards boards. There is little scope for discretion and discussion of individual performance. Decisions are now highly algorithmic as SITS has embedded decision logic and automated rules within it.

5.6 Structure or re-structure

It was interesting that at the beginning of SITS use there was no re-structuring of departments or administrative offices. However, issues arose over time that made managers rethink their approach.

- ***Reluctance to recognise the re-structuring caused by SITS.*** : In New University although the organisational structure of the whole institution did not change there were some reports from staff in individual schools and departments who suggest that either before or after SITS there was some restructuring. However, people referred to this change using words such as 'rearrangement' or 're-organisation' rather than restructuring. It was mainly academics that referred to a re-structure whether most administrators either said that there was no re-structuring or that there was just a re-organisation of certain departments. It is not clear why members of staff might have been reluctant to accept that there was a restructuring because of the implementation of SITS. However, this diversity of opinions and unwillingness to admit change could be an indication of the various sub-cultures as well as highlights the difference in attitudes, values and beliefs among administrators and academics.
- ***Restructuring was required in order for SITS to work:*** In New University departments often had to change their structure in order to better interface with SITS. Thus, the system determined the structure. One academic suggested that they had to restructure because the new system showed all the gaps in their way of operating and therefore a restructuring was inevitable.

5.7 Technological discourse

The exploration of the institution's discourse seems to bring to the surface once more the diversity that exists between sub-groups and highlights their differences in

attitudes, values and beliefs which consequently increases miscommunication and the break down in professional relationships. There are three kinds of discourse in the institution: the '*common jargon*' that also existed before SITS, the '*administrator's SITS jargon*' and the '*SITS team jargon*' that was developed after the implementation of the new system.

Common Jargon: This is typical of any organisation that uses its own terms and abbreviations within the workplace. SITS has only impacted upon this through the introduction of common terms that everyone including academics seem to recognise and use.

SITS discourse: There is also the very technical SITS jargon used by the SITS team that even lower level administrators cannot understand. The highly technical SITS language seems to be for the elite groups of the SITS team and the good housekeepers. For example **PWD** signposts a screen used for password changes, **QAS** stands for Quick Applicant Setup and **QSS** is quick student setup to name but a few specialised acronyms.

Thus, the jargon that has surrounded SITS has become exclusive and has led to SITS experts within the university that include the former SITS implementation team and the new category of the 'super' administrators, the Good Housekeepers. These individuals have gained privileged positions in the university and maintain a close attachment and enforcement of operations within the departments tied to the Academic Registry. Having command of the jargon can determine whether a member of staff achieves promotion or have a higher status than other staff.

5.8 New Power and Politics

The implementation of SITS has created new power and political bases that did not exist with the legacy systems.

- **Centralised control:** The university have now achieved a centralised integrated system that allows all departments to present data in a format determined by the centre. This centralisation is removing autonomy from the academics and the decision making power is being limited to the SITS 'experts'.
- **New subcultures:** The implementation of the new system has created roles that previously did not exist e.g. Good Housekeepers and the SITS user group.

Good housekeepers are the departmental super users who have more access rights and more specialised training than other users. Also due to the complexity of SITS and the differing needs of the departments a user group was established in order to capture the problems from the beginning of the implementation. This group has continued and is seen as a lobby group for administrators with no academic members. It is very supportive of SITS and does not raise academic issues or create trouble.

- **Loss of academic power:** Power relations have been strongly impacted and in some cases reversed. In a university whose core competence is education it can be seen that administrators and their managers are now determining policies, procedures and by implication the strategy of the university at the expense of academics. They decide on the academic calendar, student recruitment criteria, exam boards, quality audit to name but a few. Many of these used to be under the control of academic faculty members.
- **New student power:** Another growing power base is that of the 'student-customer'. Students have access to SITS and enrol themselves online. They also have access to 'myprofile' which can allow them to see marks and other personal data. One stressful example of the immediacy of data and information was this example: one academic had just submitted marks to the administrative office when he was accosted by students in the corridor demanding to know why they had received the marks they had. The academic had not realised that students had this access and was shocked by his experience. With increasing remote access to data comes the loss of personal contact between the student and academic and this further undermines the role of the academic.

In summary the emergent cultural change is complex and must be considered in a number of different ways. If the integration perspective is considered (Meyerson and Martin, 1987; Table 3) then SITS has brought about a unified approach to data collection and information management across the university. It has homogenised the student and staff data experience and has eliminated a great deal of innovation around course development as course structures must fit around the SITS data structures. Thus if this is happening in New University then similar situations must be being experienced across the UK Higher Education sector.

From a differentiation perspective SITS is being experienced and interpreted differently by various groups. Informal systems are being developed both in the academic arena and administrative area to address the inadequacies of SITS. These systems are not officially acknowledged and hence there are tensions within groups and across groups. New cultural groups are emerging – Good Housekeepers and the SITS user groups who have power and recognition within New University and have even got their own discourse.

Looking at the emergent changes within this case study it is possible to detect fragmentation growing in certain areas. There are real difficulties developing between academics and administrators to the point where there is little trust and a great deal of suspicion. Even individual identities are being challenged as SITS takes on a much greater role than ever before. Academics are being distanced from the real business of academic governance as administrative staff take on a much greater role in the management of students. Local politics and power struggles are evident in all aspects of SITS usage.

6. Discussion

Making sense of the findings is challenging and we have utilised the Meyerson and Martin (1987) perspectives approach to provide further insight as shown in Table 3:

Culture manifestations	Integration	Differentiation	Fragmentation
Certainty/Uncertainty	Prior to SITS certainty about data collection and use was at departmental level. SITS implementation brought data collection centrally and imposed strict rules. SITS forces all schools to conform to a standardized data collection and storage. Only the SITS team can develop reports.	Departments, academics not informed why SITS was needed. Selective training of administrative staff-why? Academics excluded from SITS access. Why? Complicated system:	Uncertainty has led to poorer working relationships between the centre, schools and administrators and between administrators and academics.
Loss of Trust	Prior to SITS team working staff getting on together around academic work.	SITS data inaccurate initially. Led to academics losing trust in new system as well as administrative staff.	Academics challenging SITS 'rules' and questioning new processes.
Work around the system	Prior to SITS central teams needed to manipulate data coming from departments and work around their systems. SITS gives the central university management data in the format they need.	Departments finding they need parallel systems to do their 'business' e.g. placements, non-standard degrees etc.	Individual academic staff setting up their own systems. Some accessing SITS data through informal channels.
Difficulties Working Together	Not greatly evident before SITS. Team work evident within departments.	SITS implementation caused many problems as people learnt new jobs and tasks, thus tension grew. Tensions now exist between administrative staff and academics.	Academics becoming disengaged from the university as their pastoral roles are trivialized.
New Power/Politics	Prior to SITS departments	Emergence of a new	Loss of individual

	led the university on academic student matters now central control of systems.	power bases within the administrative function around SITS e.g. SITS team, Good Housekeepers.	academic power over student affairs. Isolation for many.
Identity Change	Administrative staff prior to SITS supported academics. SITS has provided them with new identities as 'SITS' people. New central SITS culture emerging.	Academics identity changing in relation to SITS and student support. SITS team essential to functioning of university.	Individuals impacted by SITS. Some staff gaining new status, others leaving the university.
Technological Discourse	SITS has introduced a new set of jargon and discourse shared only by SITS staff – centrally and in departments.	Academics do not share the SITS discourse but are impacted by it.	Even within administrative staff the SITS discourse is not shared and can discriminate.
Structure/Re-structure	The only structure enforced on the departments is that of conforming to SITS requirements.	Many attempts to develop internal management structures to ease the SITS implementation.	Many staff believe that they have been in perpetual flux since SITS was introduced.

Table 3: An analysis of the emergent cultural manifestations using a three perspective lens

Even taking each lens and focusing on one at a time only provides insight into certain levels of the organisation when in reality they are all interacting and may have particular relevance at different times. Using the three perspectives approach advocated by Meyerson and Martin (1987) and Martin (1992) is insightful but does not capture the 'culture by proxy' of SITS and its influence on the organisational culture within which it is implemented. It is very important to better understand the new system and its 'cultural manifestations' such as formal processes, rules, jargon, staffing requirements, licence needs etc.

It is our proposal that the study of culture within an integrated information systems environment is complex and dynamic and may be conceptualised through the metaphor of the kaleidoscope. Kaleidoscopes consist of many coloured fragments which when turned change pattern and configuration and are unstable. Figure 2 contextualises this for SITS.

Figure 2: The SITS Kaleidoscope

The study explored culture at various levels – corporate, departmental, professional (Academics, administrators) and individual and considered how each interacted with the SITS system – data, technology and organisation. We then incorporated the three perspectives of integration, differentiation and fragmentation to add a further level of understanding. Reporting the finding is problematic as culture is not static and as the SITS kaleidoscope turns so do the cultural patterns over time. Thus specific incidents which occur during an implementation period may only be transient and researchers should focus on cultural trends which become increasingly more apparent.

7. Conclusion

The work presented in this paper builds upon cultural studies within the IS/IT area. It recognises that there is little agreement on how these studies should be conducted or which theoretical perspective is most appropriate. The concept of the ‘kaleidoscope’ is not unique and has been used in other contexts including cross cultural global collaborations (Gibbs, 2009). However, its use within integrated systems implementation to explore cultural change may be of interest to IS academics looking for alternative theoretical approaches. The work presented here relates to a specific context and may benefit from insights provided by other longitudinal studies of culture and integrated IS. Recently the researchers have embarked upon a two year study of a manufacturing company which is implementing an ERP system. An insider/researcher is embedded in the organisation and data is being collected. This will be reported upon at a later date.

As far as New University is concerned our research has identified some unintended cultural consequences of SITS that appear to be stabilising over time. Values are changing – administrative staff are increasingly being appointed for their IT skills rather than their interpersonal, student friendly skills. Academics are becoming disengaged from their academic citizenship roles that were prized only a few years ago. New power bases are being established which are determining how the academic business of the university is run and these exclude academics. Data requirements and formal procedures around SITS are beginning to impact upon creativity and innovation in curricula design. In isolation these may seem trivial and unimportant but when considered against the recent UK comprehensive spending review and the reduction in university funding for students could cause difficulties for New University going forward. In the new demanding world of the student/customer relationship management may become vital and SITS may have little relevance to an organisation that is getting little funding from central government.

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