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The Dynamics Of Cultural Change In An Enterprise Systems Implementation

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Abstract

Enterprise systems (ES) are important cross-business software that can be difficult to implement. A key factor impacting ES implementation lies with the influence of organisational culture which may enable or hinder such implementations. Existing research has focused on culture as being a stable, homogenous variable and little consideration has been given to the dynamics of cultural and organisational change during ES implementations. This study addresses such gaps with an in-depth case study that examined an enhancement of an ERP system. The results identified three dimensions where there was evidence of a cultural conflict between the organisation and the ES implementation, and that different subcultures within the organisation operated in different ways to facilitate or impede the adoption of the system for these groups. The evidence also showed that the implementation resulted in cultural changes within the organisation to reflect the values embedded in the ES. This research therefore provides valuable insights into cultural effects of large-scale implementations at an organisational level and shows that such effects are not necessarily homogenous and may vary due to the cultural values of subgroups involved.

Keywords: Cultural change, Enterprise systems, Dialectic analysis, Organisational culture.

Introduction

Enterprise systems (ES) are considered important business software for organisations as they enable the integration of business processes and sharing of resources across an organisation (Markus and Tanis 1999; Jones et al. 2006). Increasing numbers of organisations are installing ES modules or upgrading to full ES with one estimate suggesting that the ES market will reach $120 billion in 2012 (Gartner, 2012). However, implementing an ES is a major undertaking and businesses are losing billions of dollars annually in ES implementations that have failed or fallen short on delivering expected reductions in costs and increased profitability (Zhang et al. 2005). Because large ES implementation projects will typically cut across departmental, organisational and even geographic boundaries there is increasing awareness that organisational culture plays a major role in ES success or failure (Krumbholz et al, 2000).

Culture has been defined by Schein (1985) as the basic assumptions, values and artefacts of a group of people which influences how they view the world and behave. Research on ES and culture has emphasized the importance of cultural fit between the ES and the organisation for ES implementation success (Wang et al, 2006). However, there is a need for more research to examine the cultural dynamics present in ES implementations including cultural fit and the impact of organisational culture (OC) and subcultures. Cultural fit reflects the extent to which the organisation may need to change its culture to support ES implementation and/or how the ES may be changed to fit the organisation (Strong and Volkoff, 2010). Indeed, researchers have found that particular value orientations may predispose certain groups to favourable or unfavourable adoption of ES (e.g. Klaus et al, 2010). Indeed, where subcultures hold different values there can be tensions within the implementation which can be the basis for cultural change. Thus, there have been calls for research to more closely examine the effect of subcultural values and how these cultural dynamics can impact ES implementations and cultural change over time (Jackson, 2011).

This paper seeks to address this gap by conducting an in-depth case study using dialectic analysis to try to understand the forces at play between the ES and the organisation (e.g., Van de Ven & Poole, 1995; Robey et al, 2002). Large ES implementations in particular, represent an excellent context for examining cultural dynamics, because they can have broad effects across the organisation, impacting the organisation's culture as a whole as opposed to the more localised, individual or group level effects of smaller systems (Strong & Volkoff, 2010). The use of dialectic analysis to examine an ES implementation can also show the cultural changes or system changes that may be the result of struggles between different values. This can show how cultural change may result from an ES implementation impacting the many facets of the organisation.

1 Theoretical Background

1.1 Organisational culture and ES implementation

Enterprise systems (ES) can be defined as commercial software packages that enable the integration of business processes and transaction-oriented data throughout the organisation (Markus et al, 2003). ES can therefore include large, integrated, process-oriented, packages such as ERP systems that have been designed to meet the needs of different organisational functions such as accounting and control, manufacturing and distribution, and sales and order entry (Strong & Volkoff, 2010).

In this paper we focus on organisational culture (OC) and adopt a value-based perspective on OC. This is because values are considered more observable than beliefs, and more decipherable than symbols or artefacts (Schein, 1985). This focus on values is widely evidenced in national level studies that focus

on a select group of cultural values (e.g. Hofstede, 2001) and in organisational level studies which have identified a much greater number of cultural values (Leidner & Kayworth, 2006).

Researchers have also struggled over how to define and measure the concept of culture (see Quinn & Rohrbaugh, 1983). Using a qualitative approach Detert et al (2000) identified eight OC dimensions: Orientation to Change, Control, Coordination and Responsibility, Orientation to Collaboration, Basis of Truth and Rationality, Motivation, Orientation to Work, Orientation and Focus, and Nature of Time Horizon. Detert et al's framework has been used by researchers in IS to examine innovation culture (Khazanchi et al, 2007), organisational security culture (Ruighaver et al, 2007), IS implementations (Wang et al, 2007) and in ES implementations to examine knowledge sharing (Jones et al, 2006).

1.2 Cultural dialectics

Prior studies have found that people are mostly unaware of their cultural values until they encounter, and conflict with, a counterculture (Leidner & Kayworth, 2006). Often these instances of cultural conflict are due to tensions developing between opposing cultural values which is known as a *cultural dialectic*. Within IS research, there is a body of work that has developed a methodology for analysing such tensions. For example, Robey and Azevedo (1994) argued that *cultural analysis* could be used to identify and understand the organisational consequences of IT. Cultural analysis can also provide insight into two major issues during IT implementation. The first regards IT's social consequences which are indeterminate since users can reinvent the material properties of an IT during its use, which in turn can explain how the same technology can have different consequences within an organisation. The second issue regards IT's role in cultural persistence and transformation within organisations. *Cultural persistence* is thought to occur through a process of socialisation and institutionalisation where the technology fits in with the status quo within the organisation. *Cultural transformation*, on the other hand, occurs as a result of structural contradictions between the existing values, and the values embedded within the technology, which create the grounds for change within the organisation. This results in an ongoing tension between persistence and change forces highlighting the value of cultural analysis in trying to uncover and understand these forces.

Looking at change, Van de Ven and Poole (1995) discussed four theories of organisational change that can provide alternate views of the same phenomenon: life-cycle, teleological, dialectical and evolutionary. Within the *dialectical* view, stability and change come about because of variations in the balance of power between opposing entities. Change occurs when opposing forces gather enough strength to oppose the status quo or when the status quo is challenged by different entities and their opposing values. The dialectic cycle is therefore one of synthesis or status quo, followed by conflict between the synthesis and new values which challenge that synthesis, and result in change. The outcomes of this struggle provide the starting point for the cycle to be repeated. Dialectic analysis therefore examines the contradictions between multiple entities and opposing values. These entities can include organisations, technology, social groups or anything which contains social values. Contradictions, on the other hand, represent the struggle between these opposing values. For instance, Bjerknes (1991) states that contradictions consist of two opposites where there is an identity and struggle between each. There are two ways to find such contradictions. The first is to examine conflicts within a case study to uncover the contradictions that can exist. The second is to use the literature to identify the contradictions and then discuss these in relation to the case.

Robey and Boudreau (1999) also examined dialectics and suggested these provided a logic of opposition to findings that focused on IT as the sole determinant of change. A *logic of opposition* explains organisational change as opposing forces that promote or impede social change. They suggested several guidelines for incorporating a logic of opposition into research. Firstly, they suggest the identification of opposing forces at play during the organisational change which may be present in different interest groups within the study. Secondly, they suggest the incorporation of opposing hypotheses into the design of the research to counter the problems of directionality within such studies. Thirdly, they suggest the use of a process-oriented approach to research which can identify the

operation of opposing forces over time. Lastly, they suggest the use of multiple interpretations to avoid privileging a single, dominant explanation.

In summary, dialectics provide a useful method for analysing cultural values within case studies because they can account for the different forces that can bring about change between different entities. A dialectical approach is therefore used in this study to examine the interactions between organisation culture and ES implementation.

2 Research Methodology

In this study, an exploratory case study was used to examine the impact of organisational culture on ES implementation, and involved the inductive development of theory from the case study. This approach has been used by IS researchers when the phenomenon under question is not fully understood and where the researcher is engaged in theory-building types of research (Eisenhardt, 1989; Kirsch, 2004). Detert et al's (2000) organisational culture dimensions were used as an *a priori* specification of the constructs that were examined in this cultural analysis (Eisenhardt, 1989) and provided a foundation for the development of an interview guide and case study protocol (Yin, 2003), including an overview of the case study, field procedures, and case study questions.

Data analysis began in conjunction with data collection (Eisenhardt, 1989), with a project journal used to log issues and investigate lines of inquiry over multiple interviews. All manuscripts were read through and the content coded into important issues and events (nodes) using an open coding process. These nodes were then cleaned up to remove matching nodes and grouped together. This helped to document all the different issues in the case and served as an evidence bank for the subsequent cultural analysis. This research also used the open coding methodology to identify important cultural values within the case (Kirsch, 2004) that could be compared with Detert's dimensions. A subsequent round of coding was therefore conducted to identify evidence of each of Detert's cultural dimension within the case. In general, there was good fit with the dimensions supporting the use of these to code the interview data. Following the coding process, a case narrative was written up to provide a coherent story from all the different sources of the implementation project and its events from start to finish.

Dialectic analysis was then used to try and understand the forces at play between the ES and the organisation (Bjerknes, 1991; Robey & Azevedo, 1994; Van de Ven & Poole, 1995; Robey and Boudreau, 1999; Robey et al, 2002). An ES can be viewed as a material artefact (Orlikowski, 1992), such that it is the product of human development which reflect the rules, norms and assumptions that developers build into the technology. As such, the inherent cultural values of the ES can oppose those of the organisation when it holds different values, which can then create a *dialectic*. The previously identified Detert dimensions were used to characterise the dialectics in this case study. These dimensions formed the *contradictions* (Bjerknes, 1991, Cho et al, 2007) of the dialectic analysis and were used to analyse the tensions within the case study to identify conflicts between the organisation and the ES. The data was therefore analysed to identify examples of struggles between different cultural values within each cultural dimension.

The dialectic analysis approach used was adapted from Cho et al (2007). Contradictions, struggles and consequences were identified using an iterative process, where the *struggle* is evidence of tensions within the case between opposing values of each cultural dimension, and the *consequence* is the result of the struggle and its impact on the implementation. Each cultural dimension node, identified during the coding process, was first interrogated to identify consequences and to split the evidence into each dialectic pole. Next, evidence from each pole was grouped into related issues which showed the struggles within the implementation. This drew on the work of the narrative to contextualise the importance of each struggle within the implementation as a whole. From this, the results could be generated which included a list of the cultural dimensions most affected, evidence of struggles that occurred, and the impact/consequence on the implementation as a whole. A similar approach to

examining the evidence of dialectics was used by Soh et al (2003) where examples of opposing forces (i.e. the struggle) were detailed as well as the impact on the implementation (i.e. the consequence).

3 Case study introduction

This case study examined the implementation of an Asset Management System into the Parks department of Delta City Council (DCC). The Asset Management System project was essentially an enhancement of the Council's existing ERP system to enable the use of an asset management module. This system replaced the disparate and individualised systems being used throughout the Parks department. The implementation involved reconfiguring aspects of the asset management module, reconfiguring its links to the finance module, and the development of a business-to-business (B2B) interface for the Council's large group of contractors to schedule necessary asset maintenance through work orders. The Parks implementation would be the first part of an on-going project to rollout asset management to other areas in the City Assets Group (CAG) to which Parks belongs. Parks was chosen for the initial pilot because they had the weakest systems within CAG and held a variety of assets that were used in other departments. The project also involved the development of asset standards which were adopted and revised from International Asset Management Standards (IAMS) and these would be incorporated into later rollouts.

Over time there had been a growing need for assets management in Parks. Internally, Parks had never had particularly strong systems for managing assets; however, the introduction of new government regulations increased the need for external compliance. There was also pressure from regulatory authorities to tighten up the management of assets that were public property. Councils needed to know what assets they had, how they would maintain them, how they would renew them and how they would manage them. Coupled with the need for external compliance, were internal pressures from operational staff that were vocalising the need for better asset management. Several studies were conducted which found that Parks was lagging behind the other areas in CAG and needed to improve its systems to be able to consistently manage and track their assets. There had been a variety of systems used throughout CAG which had been built up unequally over time. In Parks, the systems they had no longer met their reporting or analysis needs, such as identifying how much they were spending on certain assets or the history of various assets.

Data collection for this case study involved semi-structured interviews (lasting about 1-hour each) with 10 project and organisational staff (Table 1) engaged in the ES implementation. Interviews were transcribed. Project notes were also collected and some project documentation also examined.

Respondent role	Project Phase Involvement
Asset management (AM) team leader	All
Asset management team member	All
ERP support team member	Project to shakedown
Parks contract manager	All phases
Parks user team leader	All phases
Asset management team member	Project to onwards and upwards
Asset analyst engineer	Project to shakedown
Executive board member	Chartering and project
Parks contract manager	Shakedown to onwards and upwards
Project manager	All phases

Table 1. Respondents and implementation stages they were involved with

4 Results

The enhancement of the ERP is examined in this section in conjunction with three dialectics which were found to create significant conflict across the implementation. These dialectics came from each of three cultural dimensions (noted in brackets) (Detert et al. (2000); these were: Concentration versus Autonomy (Control, Coordination and Responsibility), Personal Experience versus Hard Data (Basis of Truth and Rationality) and Results versus Process (Orientation to Work). Each dialectic provides evidence of differences between the cultural values of the organisation and the ERP project and the struggles that resulted. In line with the dialectic approach identified earlier, the struggle between values is detailed below, followed by an analysis of the consequence of that struggle for the organisation. These results are summarised in Table 2.

Contradiction (Cultural Dimension)	Identity	Struggle	Consequence
Concentration vs. Autonomy (Control, Coordination and Responsibility)	Within the DCC there were common goals and priorities aimed at meeting the needs of the community and regulators. However units had their own priorities, goals and ways of meeting such goals.	Units often did not share a common purpose, and had their own processes and ways of doing things. These they had to mostly forego in favour of centralisation of processes to support the ERP implementation.	*Disruptions* as units could not agree on common goals and struggled with having to give up power and responsibility. More *central monitoring of staff* and senior manager involvement to *rectify disputes*. As a result, the DCC became more concentrated.
Personal Experience vs. Hard Data (Basis of Truth and Rationality)	Reliance on personal experience to solve problems; use of data for problem identification and resolution was more often confirmatory and second to personal experience.	Contract managers had to become more data-oriented to use the system, which conflicted with their focus on personal experience for identifying problems.	Different groups struggled with the ERP depending on their orientation to hard data vs. personal experience. Contract managers struggled as the DCC became more data-oriented, while Asset Management (AM) staff embraced the change as the system fitted well with their data-orientation
Results vs. Process (Orientation to Work)	Results were most important at the DCC but the way in which things were done often had an impact on the results that were achieved.	There was a mix of value orientations in the DCC with units holding conflicting views regarding the process orientation of the ERP; most struggled with abandoning their results-orientation for a process-oriented approach. Contract managers struggled to change from their results based 'fire-fighting approach' to a more planned approach to work management.	Contract managers, though resistant, have become more process oriented as the system requires the orderly collection of information if its benefits are to be achieved. The change has resulted in the DCC becoming more process-oriented than before.

Table 2. Results summary

4.1 Concentration vs Autonomy

The cultural value of concentration versus autonomy examines the extent to which organisations have decision-making structures centred on a few people (concentration) versus the dissemination of decision-making throughout the organisation (autonomy). Within the DCC individual units make their

own decisions to serve their needs, often without reference to the needs of others. However, the organisation itself has a common purpose towards meeting the needs of the community and those of regulators. This constitutes the identity of the dialectic where the struggle was between forces of autonomy within the organisation and those promoting standardisation and centralisation as part of the ERP enhancement.

4.1.1 Concentration of power versus the autonomy of staff

Autonomy dominates the culture of the DCC. The DCC has been built up from the conglomeration of many smaller Councils and independent businesses over time. This provides the basis for the autonomy that exists because there has been little attempt to integrate these units within the DCC. For example, urban parks and rural parks were viewed as almost distinct entities within the DCC with different rules, responsibilities and organisations. Once the project was under way, staff were brought together to work on the Asset Management project and the requirements they needed from the system. Thus began the process of breaking down some of the autonomy of staff and putting them in good stead for when they would need to start using the system together.

Staff were deliberately selected from groups which held influence over important processes. This approach also enabled centralisation of decision-making that was imperative in dealing with the many autonomous managers that were involved in the process. At the same time, the concentration of power also served to marginalise some members who resisted the change. For instance, at the start of the project, there was conflict between IT and the project manager as to the direction of the project. The project manager wanted the business to work out what they wanted which meant putting IT on hold until this was resolved. During the project there was also a conflict over the prioritising of resources with problems arising where there was no guidance around prioritisation. There were also problems with the naming conventions used in the data upload. Those involved did not consult the affected business units and applied their own naming conventions to assets which made it difficult for Parks staff to use the system as the names did not make sense to them.

4.1.2 Concentration of processes versus autonomous processes

Looking deeper into this dialectic, there was evidence of a struggle between concentration and retention of business processes. This began with business units having to adopt the new, agreed upon, version of IAMS that would replace how they managed assets. The adoption of IAMS replaced different standards with a single standard to be used across DCC. In addition, the project introduced the ERP as a single asset management system that all departments would use. For instance, in Parks they used processes which were not easily shared, or fit common standards, but which suited their own particular needs. The ERP project meant that many of these autonomous processes have been replaced by common ERP processes. As a result there has been resistance to the new system from staff who have lost their own ways of doing things. The struggle has been in trying to align staff with a common view of the DCC and breaking down some of the divisions that existed for the good of the organisation. Staff have also been pressured to use these new processes with policing set up to monitor system use. For example, there has been increasing pressure on unit managers to ensure staff correctly use the system and for system use to become part of their performance evaluations. However, in some cases this has been blocked by managers who do not see compliance as a priority.

4.1.3 Consequence

The struggles between the autonomy at the DCC and the centralisation needed to support the ERP have had a variety of impacts on the project. These included disruptions to the project, problems with the prioritising of resources across competing IT projects and, differences between IT and the project manager. The struggles were also manifested in a resistance to change among some staff. In terms of processes, the consequence of the struggle between autonomy and centralisation has led to more strict

monitoring of, and enforcing, staff use of the ERP. Indeed monitoring has been an effective tool to ensure staff use the system as they should. The result of these struggles and the increase in centralisation that has accompanied the ERP has moved the DCC away from being as autonomous as it once was. The ERP and its concentrated processes has helped to break down some of the silos within the DCC with staff starting to realise they are part of a single organisation now.

4.2 Personal experience and intuition versus hard data

The dialectical dimension of personal experience versus hard data examines the extent to which organisations seek truth through systemic, scientific study using hard data or through personal experience and intuition. At DCC both orientations were observed and it was often the case that personal experience was used to identify that a problem existed before hard data verified this was the case. However, these forces can be contradictory which forms the basis of the identity of this dialectic.

4.2.1 Standardisation of data versus experience of assets

The introduction of the ERP changed the work practices of contract managers (CM) and other Parks staff creating conflict. Prior to the implementation, CMs used to do a lot of their work in a very reactive fashion. For example, when notified of a problem a CM would organise for it to be fixed, and it was only through their personal experience could they identify if this was an ongoing problem or not, that might need a deeper solution. For instance, a water pump may be continually failing and this could be due to the pressure into the pump, or the type of pump used, or the pipe design, rather than just a problem with the pump itself. The ERP enhancement required a change to this way of working, as there are now detailed records for each asset easily available and damage and failure codes now clearly indicate when deeper solutions may be required. Such problem analysis is now data-led rather than experience-led as before. The standardisation of asset types also means that different assets can be compared across the DCC which can improve their maintenance.

The standardisation of data has been a major change for CMs and acceptance has been mixed. Some have struggled to become more data-oriented, while others have embraced the benefits this had for their work. Staff that struggled often fail to rigorously assign work orders to assets which affects system benefits. There have also been problems with CMs generating reports as they argue that they are not proficient in the system because they do not use it enough. Instead, there is some expectation that others should generate these reports for them, while the Assets Management group (AM), who supervise the assets and oversee the CMs, have the view that CM's should produce these reports themselves. Many CM's do not appreciate the value of such reports for informing their work practice while AM are wholly accepting of the use and importance of such reporting. This shows evidence of a dialectic clash between different organisational groups in the DCC. While the CMs are oriented towards personal experience and have resisted the ERP and its hard data orientation, in contrast AM are more accepting as they regularly work with such data. This orientation is also behind their push for more compliance from Parks in how they use the system to ensure asset-related data is captured. Thus, there was a cultural difference in the values placed on data between the groups and ongoing tensions based on their respective values towards the system.

4.2.2 Consequence

The enhancement of the ERP resulted in a struggle between the cultural values related to the basis of knowledge within the organisation. The ERP supports a hard data orientation which was seen in the way that data could be recorded and used to diagnose and analyse the use of assets at the DCC. This conflicted with the working styles of CMs who were used to using their own experience to diagnose problems, and did not see the value of using hard data for these diagnoses. The need to report more fully on assets also created conflict with many CMs who did not see how this relates to how they worked. The evidence therefore showed there was a diversity of values on this cultural dimension that

affected how groups adapted to the new system. Where there were opposing values there were tensions and this played out across the implementation.

4.3 Results versus process

Results- versus process- orientation captures the extent to which individuals in organisations focus on work as a *result* or on the *process* by which work is done, as a means to achieve other ends. Within the DCC different units focused on either process or results, with AM being very process-oriented and Parks much more results-oriented. The struggle between these forces constitutes the third dialectic discussed in this study.

4.3.1 The DCC's results orientation versus the need for processes in the ERP

The DCC is an organisation where there is a mixture of process and results orientation across the different units that were involved in the implementation. AM ran the project and tended to have more of a process-orientation, which was indicative of the approach used by the engineering staff that predominantly made up the unit. Parks were not as process-oriented and one of the aims of the project was to improve the systems and the planning within the unit. Parks tended to be more results-oriented which suited their work practice of going out and 'fixing problems'. For example, they would go out and build things without being "super accurate" about job cost or considering whether collaboration with others would have better outcomes. CMs were one group within Parks that were very results oriented which reflected their 'fire-fighting' approach to sorting out problems. This was evidenced with the informal relationship with contractors where problems were referred directly which circumvented the need for formal requests. Differences between AM and Parks was also evident during requirements planning where AM felt it necessary to ensure Parks staff understood the implications of any decisions made. For instance, if Parks staff asked for 20 different items on a form then they needed to understand that they might be the ones that would need to complete such a form. This showed the differences between these units, where Parks perhaps did not have the same understanding of processes that AM had.

The ERP project has introduced many new processes to Parks and consolidated others. CMs have therefore had to change the way they work with various systems and attend to these new processes. This involves not just capturing the work done by contractors on assets, but also the financials related to the assets, so that the actual costs of managing these assets are available to managers. This information can then help CMs become more proactive in how they work as this data can help them identify potential problems ahead of time. The downside though is that some CMs have seen this as more work that needs to be done, and do not see the benefits of such a process. It has therefore not been easy for CMs to adjust to a process-oriented work style, and this has not been helped by the presence of system errors and incomplete processes. The ERP is also more cumbersome to use because there are more detailed forms to complete and authorisations need to be done 'on the spot'. This provides more control, but at the expense of a longer process, so there have been attempts to shortcut the system. For example, some CMs still use the old system because they want to ensure that this is updated for the general public; however this updating is not always done in the ERP due to bugs with the system which prevent this information from being shared all the time. Also, CMs who log work orders often do this directly to Parks circumventing the need to detail what the work orders are for, and in so doing, failing to capture the information needed to better manage the assets.

4.3.2 Consequence

The ERP project has meant a shift towards a more process-oriented approach at the DCC. This was evident with CMs becoming more process-oriented in order to comply with new guidelines and improve performance. In particular, for CMs this has meant a change from 'putting out fires', to a more planned, proactive approach. This has been difficult for many to adjust to. CMs have had to

change their mind-set to cope with the ERP, and the new processes which were necessary to provide the information needed for asset management. Examples of this struggle involved things like contract managers not linking work orders to individual assets and continued use of legacy systems.

5 Discussion

The purpose of this paper was to examine the dynamics of OC within large-scale ES implementations. By their nature, ES impose their own logic on organisational structures and business processes (Davenport, 1998) so it is perhaps of little surprise to see that there are cultural impacts in such contexts. In this study, a dialectical analysis has uncovered the tensions that arise when there are mismatches between elements of the OC and those of the ES project. This addresses the importance of cultural fit in ES implementations and builds on the work of Strong and Volkoff (2010) and their misfit model by identifying three cultural value dimensions where there were problems with cultural fit. This is important because addressing cultural fit should enable more rapid achievement of benefits for the organisation (Strong & Volkoff, 2010). Through the use of dialectics, the dynamic struggle between these values was shown in the impact they had on the implementation. There were conflicts between autonomy and centralisation, personal experience versus data, and process versus results. The study showed how conflicts between the different cultural values of the ES, the organisation, and sub-units within the organisation can result in struggles that impact the implementation, whether they hinder or promote implementation success. This addresses gaps in research regarding what cultural values are important and the dynamics of how these values impact on ES implementations.

The dialectic analysis has also shown how ES implementations can shape the culture of the organisation. Indeed, Leidner and Kayworth (2006) found that two thirds of empirical studies examining culture and IT investigated the phenomenon from the integration perspective (Myerson & Martin, 1987), such that culture is viewed as persistent, uniform and consistent across the organisation. The literature has also focused on the impact of culture on technology, without considering how culture can be affected by IT as well. The findings from this study showed how dialectic struggles could lead to cultural change. These findings build on and extend the little work done in this area. For example, Jarvenpaa and Leidner (1998) showed how a local firm was able to shape their local culture by pioneering new information technology. This study extends such work by providing empirical evidence within an organisational context of how a set of cultural values changed as a result of the implementation. For example, the ERP enhancement meant that the siloed nature of the organisation has lessened, as units begin to share more common work processes within an integrated system. Further, the newfound importance placed on data, coupled with the need to attend to the processes within the ERP, is changing the work practices of CMs, and over time is expected to impact their cultural values as they become more process oriented. This ongoing cultural change comes at a price with this study highlighting some of the struggles and resistance (e.g. system avoidance) that has accompanied this change in values.

This study also provides evidence to challenge the dominant view within the literature that considers culture as being homogeneous and stable across ES implementations (Leidner & Kayworth, 2006). Extant studies have treated culture as being homogeneous and do not address the existence or impact, of different cultural values that may exist within an entity (Jackson, 2011). The few authors that have examined these subcultural differences have found an impact. For example, Huang et al (2003) investigated the relationship between organisational subcultures and the adoption of component-based software development methods. They found that the clash of values between these subcultures could hinder the information sharing and collaboration to integrate such technology. Von Meier (1999) also examined work group subcultures and found that two groups had different cultural interpretations of the technology leading to conflict and resistance in their adoption.

This study showed evidence from two organisational units that had markedly different subcultures. Assets Management (AM) had a cultural orientation that favoured processes and data which was a good match with the values of the implementation and which helped them adapt to the use of the ERP.

In contrast, CMs had different values – they were more results and experience oriented, which has impeded their adoption and use of the system. Further, there have been conflicts between these two groups as a result of their contrasting values, which have created further problems for the implementation project. For instance, CMs often failed to complete work orders as they should, with AM implementing procedures to monitor and enforce their use. However, the level of autonomy held by CMs has prevented AM from pushing the issue further. Altogether these findings show that for this case, organisational culture was not homogeneous and that differences between subcultures can have different impacts on the implementation, with some values supporting the implementation and others hindering the project.

6 Conclusions

In conclusion, by examining the dynamics of OC across an ES implementation this paper builds on current understanding of how to implement ES systems. In this study, the use of dialectics provides a deeper understanding of what causes conflict and struggles within implementations, moving away from a discussion of simplistic factors to a deeper understanding of the dynamics involved in ES implementations. Further, evidence from this paper argues against the notion that culture is homogenous during IS implementations (Leidner & Kayworth, 2006). One implication is that where subcultures exist, there are likely to be differential impacts which may support or hinder system adoption for each group. Researchers therefore need to be aware of the presence and possible dominance of some subcultures when accounting for culture in implementations. Indeed, this study furthers the view that culture is not homogenous and that cultural dynamics can influence ES implementations over time (Jackson, 2011). However, more work is needed to examine the impact of cultural dimensions in different organisational contexts to determine what dimensions are important and what impacts they have. This can help identify and provide evidence that such cultural effects are generalizable beyond the context of the single case investigated here.

The dialectic analysis used in this paper has also demonstrated its value as a foundation for such work. From a practical point of view, the study results underline the importance of engaging in some form of cultural analysis to understand the potential cultural dynamics involved, and resolve cultural misfits between ES and the organisation. Such findings could help practitioners to better marshal resources towards managing such impacts. In particular, practitioners can use this research to identify whether, and in what ways, the organisation may be better off after the ES due to changes in culture within the firm (Strong & Volkoff, 20120). For instance, one downside of this case is that the change to a more process-based approach may result in staff feeling they are less equipped and able to deal with problems that require urgent ‘on-the-spot’ attention in the future.

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