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THE DIFFUSION OF MANAGEMENT INFORMATION SYSTEMS IN ORGANIZATIONS – AN ORGANIZATIONAL SUB-CULTURE PERSPECTIVE

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Abstract

The success of deploying Information Systems (IS) by organizations is dependent on the full integration of the new innovation into their existing processes (Diffusion). The failure of an IS to be fully diffused in an organization is, in most cases, not due to any inadequacy of the technological innovation, but rather due to conflict and a lack of acceptance within the organization attempting to implement the change. The analysis of organizational sub-cultures in IS research has proved to be a valuable approach to generate deeper insights regarding IS usage and success experienced by organizations. However, organizational subculture, and specifically the fragmentation sub-culture have not yet been used to investigate the diffusion process of IS in organizations. This paper tries to fill this gap by adopting Martin’s (1992) sub-culture framework to explore the process of diffusion of a Management Information System (MIS). The six stage IS implementation model by Cooper and Zmud (1990) will be applied to the research to illustrate and investigate the process of diffusion of the MIS. The research method will be an in-depth case study. It is anticipated that investigating IS diffusion from the theoretical lens of sub-culture will significantly advance our understanding of the diffusion process of IS.

Keywords: MIS, Diffusion, Organizational Sub-Culture, IS implementation model
Introduction

The adoption of a particular Information System (IS) innovation by an organization is, on its own, not sufficient to have a positive impact on the organization’s processes (Fichman and Kremer 1999). To take full advantage of the adopted IS the organization needs to fully integrate the new innovation into its existing processes (diffusion) to improve operational and managerial activities (Zmud and Apple 1992). Previous studies have highlighted that after the euphoria of adopting a new technological innovation, the majority of organizations do not utilise the technology to its full potential thus creating an “assimilation gap” i.e. the difference between the wide spread use of the system and adoption of the system (Cooper and Zmud 1990). This assimilation gap leads to low levels of diffusion of IS in an organization and can undermine the ability and capability of the innovation to increase efficiency and generate savings in time and costs. In most cases, the failure of an IS to be fully diffused in an organization is not due to any inadequacy of the physical devices, but rather to conflict and lack of acceptance within the organization attempting to implement the change (Von Meier 1990).

The use of Organizational Culture (OC) in IS research has tended to explore the relationship between the constructs of OC and IS to further explain and generate deeper insights in the different IS issues experienced in organizations. However, as highlighted by (Leidner and Kayworth 2006, Ravishankar et al 2009) very few studies have empirically examined the role of organizational subcultures in the implementation/diffusion of an IS innovation. Taking a subculture perspective helps to give a better understanding the role of OC in the implementation and managing of IS in organizations, because it highlights that different sub-groups have their own values, behaviours and practices (Martin 1992). This can facilitate an understanding of how cultural values predict whether a group will adopt an IS and an understanding of the dynamics of the implementation process, an issue that has been missed in previous IS-Cultural studies (Leidner and Kayworth 2006).

Management Information Systems (MIS) are complex and sophisticated systems and that can support different interpretations and levels of utilization (Orlikowski 1993). They are examples of a multi-faceted IT artefact that are package of material and cultural properties in some socially recognizable form such as hardware and software (Orlikowski and Lacono 2001). These interpretations are likely to be influenced by the cultural behaviour of different groups within an organisation. Therefore, an MIS provides an ideal subject to examine the effect of different subcultures on the process of diffusion. The overall aim of this research is to explore the process of diffusion of a MIS from the theoretical perspective of organizational sub-culture. More specifically, this study seeks to address the following research questions: (1) How do organizational sub-cultures influence the diffusion process of a MIS? (2) Which stages of the MIS diffusion process are affected by the sub-culture of the organization?

In the following, the paper is presented. Firstly, the research background provides a short review of IS diffusion, organisational culture and subcultures. Against this background, the research gaps are identified. We subsequently introduce our methodological approach to address the proposed research questions and explain the impact we anticipate from our research.

2 Research Background

2.1 IS Diffusion

Research has shown that organizations cannot just expect the adoption of IS to generate superior services and reduced operational costs (Peppard and Ward 2004). The organization must ensure that the functionality of the adopted IS fits with the organization’s procedures and strategies. This can only be achieved if top management, business managers and users of the system are empowered to understand, accept and use the system. These arguments suggest that for an IS to achieve its benefits,
it must be fully implemented/diffused into the organizational setting (Huang et al 2003). To facilitate a better understanding of IS diffusion in organizations, Cooper and Zmud (1990) proposed an IT implementation model based on the organizational change, innovation and technological diffusion literatures (see Figure 1). The model shows diffusion of IS in an organization involving six-stages: Initiation, Adoption, Adaptation, Acceptance, Routinization and Infusion. The initiation stage concerns how the organizations view IS innovations to help solve organizational problems/opportunities. The adoption stage highlights factors that are considered by top IS and Business executives to agree to invest in the IS. The adaptation stage occurs when the adopted IS application is developed, installed, and maintained. The acceptance stage is when the IS is employed in organizational processes. The routinization stage is when the use of the IS has become a normal activity in the organization. Finally, the Infusion stage, is concerned with increased organizational effectiveness obtained from utilising the IS to its full potential in a more comprehensive and integrated manner.

Figure 1: IT implementation model: (Cooper and Zmud, 1990)

Cooper and Zmud’s model has been frequently used in information systems research, to investigate diffusion. For example, exploring assimilation of Internet-based e-business innovations by firms in an international setting (Zhu et al 2006) or the implementation of Component-based development (CBD), enterprise-wide software, IS (Huang et al 2003). Consequently, Cooper and Zmud’s model is a good basis to study IS diffusion.

2.2 Organizational Culture and Sub-Cultures

Schein (2004) defines OC as the shared beliefs, ideologies, philosophies, rituals, myths, and norms that influence actions taken or behaviours of people in an organizational actions or behaviour. Leidner and Kayworth (2006) have highlighted how OC theories have been adopted in IS research. They argue that culture is a significant construct in explaining how social groups interact with IS innovations. The findings highlight that there may be conflicting consequences of IS implementations due to the potential differences in set of values experienced in organizations (Robey and Azevedo 1994). Blacker (1995) argues that humans will behave differently and have different relationships with their organization based on the demands from the job, their orientations, methods and perspectives. Humans make sense of their job roles by the boundaries that exist in organizations. This is despite the fact that contemporary IS deployed in organizations are intra-organizational in nature and span across the boundaries of the organization (Newell et al. 2001).

Many previous studies have assumed culture in the organization to be uniform and consistent culture across all sub-units studies. However, Martin (1992) presents a different conceptualization of OC and introduces the notion of organisational sub-cultures. Subcultures are the influence of the practices, values and beliefs of various subgroups which are different from the overall OC. The assumption of OC as uniform and consistent is termed the integrative paradigm by Martin. It is one of three perspectives on organizational culture, differentiated and fragmented perspectives being the other two.

The integrative concept of OC shows the organization having a persistent, consistent and distinct culture across all sub-units. The integration sub-culture perspective assumes that basic assumptions are shared among organizational staff, so as value symbols and ritualized practices. The integrative view assumes that members of a social system are all clear about the interpretation of manifestation and view interpretations of processes in the same way (Kappos and Chivard 2008). This results in no
ambiguities existing among members of the system, thus all behaviours and practices are to achieve the same set of goals.

The differentiation perspective focuses on differences within an organization, the unavoidable influence of power and conflicts of interests which leads to a differentiated culture. The differentiation subculture perspective unlike the integration perspective assumes that different sub-groups in an organization understand manifestations of culture differently. It sees sub-cultural relations as hierarchical with no place being neutral to the overall OC. This explains the sub-cultural boundaries that exist in organizations. However, in the differentiation perspective there are some elements of unity and consensus in the manifestations of culture within the boundary of the subgroup as characterized in the integrative subculture. Kappos and Chivard (2008) argue that ambiguous interpretations do not exist in the differentiation sub-groups and those ambiguities that exist outside the sub-group highlights the boundaries between the subcultures.

Martin (2002) argues that the fragmentation perspective highlights ambiguity as the core of culture. She further suggests that the clear consistencies and inconsistencies found in the integrative and differentiated perspectives respectively are hardly evident in the fragmentation viewpoint leading to a “No stable organizations-wide or sub-cultural consensus”. Ambiguities arise in the fragmentation perspective because temporary concerns and interpretations of culture do not unite into shared opinions either in form of agreement or disagreement. These ambiguities in interpretations are likely to result in paradoxical or ironic actions and reactions (Kappos and Chivards 2008). They further argue that the ambiguity that causes fragmented views does not suggest any clear cultural or sub-cultural boundaries within the organization. The paradigm of fragmented subculture views culture as varying between different organizational groups, implying that culture can be as much a fragmenting force as a unifying one (Van Maanen and Barley 1985). Despite the fact that employees of an organization believe that they belong to a single OC, often they do not “agree on clear boundaries, cannot identify shared solutions, and do not reconcile contradictory beliefs and multiple identities” (Meyerson 1991, p 131). This results in staff having different interpretations with no clear agreement of processes such as the use of an IS.

Several IS researchers have adopted aspects of the subculture in their research. El Sawy (1985) and Robbins (2000) have used the integrative subculture perspective assuming that OC is homogenous within and across all subgroups. They did not specifically address the likelihood for competing culture, conflicts and opposing IT outcomes that may occur among organizational subgroups. Similarly, Von Meier 1999 and Huang et al 2003 have used the differentiated subculture in their studies to develop a richer understanding of the culture and the use of IS in organizations. However, the subculture perspective remains under utilised in IS research which is especially deficient regarding the fragmentation perspective.

2.3 Research Gap/Research on the intersection of Organizational Sub-Cultures and IS Diffusion

Researchers have called for further research to be undertaken to explore the influence of sub-cultural fragmentation in IS implementation (Huang et al. 2003). This underscores the limited knowledge on how and why the fragmented subculture perspective can affect the diffusion of IS within an organization. This perspective may be valuable for describing the complexity staff face in the daily use of a contemporary sophisticated IS. The use of the IS may be interpreted differently by users and groups in the organizations. For example, the use of an IS innovation may be a radical/shock to some (Thong 1999). Alternatively, some users may perceive it as enhancing the organization’s dedication to the use of IS while others may perceive the use of the IS as just a slight change they must undertake as part of their daily tasks. These micro and hidden perceptions of ambiguities may be illuminated by the fragmented sub-culture perspective and allow better sense making of the process of IS diffusion.
In addition, adopting a subculture perspective for the investigation of IS issues in organizations is vital because an IS innovation can acquire different meanings among the different groups in an organization considering that deployed IS are intra-organization in nature due to the interconnectivity of tasks experienced in organizations. Robey and Azevedo (1994) argued that the conflicting outcomes should be expected rather than seen as anomaly in the use of an adopted IS in different subgroups of an organization. According to Martin (1992), each subculture perspective is an interpretive framework that is subjectively imposed by the researcher while in the process of collecting and analyzing cultural data, thus no single perspective should be seen as more suitable than the other when adopted to investigate a research problem. This argument by Martin (1992) was further buttressed by Huang et al (2003). They stated that empirical data can be collected from each or all of these perspectives but selecting a particular perspective of subculture will facilitate the generation of “concise and coherent” insights to IS theories to investigate implementation and managing of IS innovations in organizations.

Cooper and Zmud highlight the rational and political negotiations that occur among top IS and Business executives when discussing whether to invest in an IS and the associated resources required. These negotiations are necessary because of the high level of uncertainty and ambiguity that ensues when the organization tries to infuse the adopted IS into its processes. The struggle to understand the diffusion process of IS in organizations may be due to the intra-organizational groups and their alliances in relation to the use of a new IS. Most contemporary organizations rely on intra-organizational alliances across strategic, tactical and operational levels to ensure the effective use of an IS to achieve strategic objectives. It is likely that these different groups or units in an organization need to work in alignment to achieve the overall objectives of an organization. However, a small number of studies have found these that different groups have separate subcultures that are different from the overall OC (Ravishankar et al 2009). Consequently, it is possible that strategic alliances and different subcultures that exist in the organization may influence the IS diffusion process. Previous models and studies have not considered this perspective and so our research builds on Cooper and Zmud’s diffusion model and enhances it by adding OC and specifically organizational subcultures to better understand the process of IS diffusion.

This study will investigate all three culture perspectives at the organizational and group levels and thereby examine the interplay between the three perspectives at two levels of analysis (organizational and group). This will help provide fresh insights on how the fragmentation perspective of OC may impact the diffusion of an MIS in an organization.

3 Research Methods

The study adopted a detailed in-depth case study approach using semi-structured interviews. The case study is a Nigerian Bank XYZ – a pseudonym and examines the diffusion of a MIS within the bank. The specific MIS studied is called Maxim. The Maxim system is a three-tier software architecture designed to support the financial and operational departments of the bank. Maxim facilitates the access and analysis of operational data to generate information and reports for management to make timely strategic decisions. Banks that use the Maxim system include Citibank and Samba Bank (formerly known as The Saudi American Bank). The budget for the development and implementation of the MIS in Bank XYZ was 3.25 million US dollars. The bank began developing the MIS in early 2007 and implemented the MIS in August 2009. Much of the work was undertaken by IT expatriates from India and local IT staff supervised by an IT expert, a former member of Citibank, London. The bank was selected because it is a global bank operating in 19 countries including the UK, US and France, and because it was one of only three banks in Nigeria that have deployed a robust enterprise MIS.
The study was approached with the premise that the three perspectives of OC and the elements of sub-culture existed at the site Martin (1992) and it explores their influence on the diffusion of the MIS. The theoretical sampling technique (Walliman, 2008) was adopted and senior representatives of the bank at strategic, tactical and operational levels were selected for interview within the IT, Finance, Risk, Credit, Operations, Performance Planning, Mobile Banking, E-Banking and E-Products units. Senior representatives were chosen as interview partners because they are assumed to be the most knowledgeable respondents in the bank. An interview schedule was developed based on existing IS literature on subculture and IS diffusion and a semi-structured interview approach was adopted for the study. Interview duration ranged between 35-70 minutes and all interviews were recorded. The interviews were conducted between December 2010 and March 2011. A total of forty seven interviews were conducted during the data collection period. The interviews are supplemented with on-site observations, and formal documentation in form of the business case for the MIS and memos and e-mail correspondence regarding policies for the use of the MIS. The on-site observations will be particularly helpful in conceptualizing the different OC and sub-cultures that may exist in the bank.

The analysis will follow the three concurrent activities identified by Miles & Huberman, (1994) of data reduction, data display and conclusion drawing/verification. The analysis and coding of the data will be done both deductively and inductively. A deductive approach will be used to initially code the data using codes related to the research questions and concepts being examined (data reduction). The exploratory nature of the research also means that an element of inductive analysis is also appropriate, to allow unexpected findings to emerge from the data. Thus, the initial coding framework will be revised and adapted through a process of inductive analysis. N’Vivo software will be used to facilitate the data coding process. The data will then be presented in a series of conceptually ordered displays (data display) in order to study the variables in more depth and generate more explanatory power.

4 Anticipated Contribution

4.1 Anticipated Impact on Science

The study will provide important new contributions in the use of sub-cultures in the IS diffusion process. Adopting Martin’s theoretical lens of subculture will help to examine the role of different sub-cultures and in particular the fragmentation perspective and in turn consider their impact on the diffusion process of an IS. The fragmentation sub-culture perspective in relation to IS diffusion has not being examined empirically and this research will help fill this gap.

4.2 Anticipated Impact on Practice

The findings from the research will also facilitate a better understanding of issues that facilitate or inhibit the process of diffusion of IS in organizations. Understanding this process will enable organizations to be more effective and efficient when adopting new IS and thereby deliver superior services for their customers and clients. These insights should help organizations manage the effect of sub-cultures during the development, implementation and use of a new IS. In turn, this should increase the likelihood of getting the best return from IS investments.

References


