INFORMATION SYSTEM DIFFUSION IN ORGANIZATIONS – AN ORGANIZATIONAL SUB- CULTURE PERSPECTIVE

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.

1   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 adopted technological innovation to increase efficiency and generate the expected savings in time and costs. In most cases, the failure of the IS to be fully diffused in an organization is not due to any inadequacy of the physical devices or technical schemes employed, 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) and subcultures (i.e., the influence of the practices, values and beliefs of various subgroups) 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 2010) 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 (Huang et al 2003, Von Meier 1999, Ravishankar et al 2010), because it highlights that different sub-groups have their own values, behaviours and practices. This may facilitate not just the understanding of how cultural values predict whether or not a group will adopt an IS but also 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 are complex and sophisticated systems and that can support different interpretations and levels of utilization (Orlikowski 1993). These interpretations are likely to be influenced by the cultural behaviour of different groups within an organisation. Therefore, an MIS provides a useful 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 Management Information System (MIS) from the theoretical perspectives of the organizational sub-culture so as to understand how organizations may ensure the full diffusion of a MIS. 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?

2   Theoretical Foundation

2.1   IS Diffusion

Research has highlighted that organizations cannot just expect the adoption of IS alone to generate the benefit of superior services and reduced operational costs (Cooper et al 2000, Peppard and Ward 2004). The organization must ensure that the functionality of the adopted IS fit 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 can only suggest that for an IS to achieve its set benefits, it must be fully implemented/diffused into the organizational settings (Huang et al 2003, Sethi and King 1994). To facilitate the better understanding

of IS diffusion in organizations, Cooper and Zmud (1990) proposed an IT implementation model which was developed based on organizational change, innovation and technological diffusion literatures (see Figure 1). The model highlights the diffusion of IS in an organization which involves a six-stage model: Initiation, Adoption, Adaption, Acceptance, Routinization and Infusion. The initiation stage looks at how the organizations view IS innovations to help solve organizational problems/opportunities which may be due to pressure that results from either organizational need (market pull) or technological innovation (push), or both. 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. When the IT is employed in organizational processes and organizational staff are encouraged to use the innovation, highlights the acceptance stage. Routinization stage is when the use of the IS applications has become a normal activity in the organization and it is no longer viewed as extraordinary, which is as a result of the organization's governance systems being attuned to account for the IS application. Finally, the Infusion stage, is concerned with the increased organizational effectiveness obtained from utilising the adopted IS to its full potential in a more comprehensive and integrated manner to support higher level of operational activities in the organization (Sullivan 1985).

Figure 1: IT implementation model Cooper and Zmud (1990)
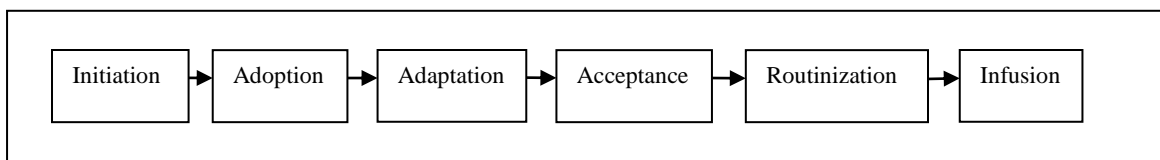
Cooper and Zmud highlight the rational and political negotiations that occur among top IS and Business executives in their attempt to agree to invest in an IS and the required resources to accommodate the new technology. These rational and political negotiations are necessary because of the high level of uncertainty and ambiguity that ensues when the organization tries to infuse the adopted IS into its processes. Cooper and Zmud's model builds on other models developed by Pierce and Delbecq 1977 and Rogers 1983 but adds the social element that is vital in the process of IS diffusion in an organization. In other words, Cooper and Zmud's model considers how the operational processes of the adopted IS will be encouraged so as to be accepted and fully used by the organizational staff as highlighted by in the acceptance and routinization stages of the model. 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 multi-levels (strategic, tactical and operational) alliances to ensure the effective use of an IT is to achieve strategic objectives. The intra-organizational perspectives suggest that there are different groups or units in an organization that need to work in alignment to achieve the overall objectives of an organization. The different groups/units in the organization may suggest sub-cultures that are different from the overall OC. It is possible that those strategic alliances and different sub-cultures that exist in the organization may influence the 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 sub-cultures to better understand the process of IS diffusion.

2.2   Organizational Culture and Sub-Cultures

Leidner and Kayworth (2006) in their extensive review of literature 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 IT innovations. OC has been found to add further insights into IS research, e.g. in the successful implementation of IS innovations (Orlikowski 1993, Ruppel and Harrington 2001). The findings highlight that there may be conflicting consequences of IT implementations due

to the potential differences in set of values experienced in organizations (Robey and Azevedo 1994). The majority of IS-culture studies have assumed culture in the organization to be uniform and consistent culture across all sub-units studies (Powell and Dent-Micallef 1997, Ruppel and Harrington 2001). This assumption of OC is termed the integrative paradigm by Martin (1992), which is one of three perspectives on organizational culture, differentiated and fragmented perspectives being the other two (Martin 1992). These three perspectives of OC can be analysed from three different levels (organizational, group and individual). Organizational subcultures highlight the power of different subgroups in organizations with their own norms, values, behaviours and interpretations that may or may not be in agreement with the overall culture of the organization (Martin 1992). The differences in values, norms, and practices exist because different groups have different roles to fulfil and have different relationships with the organization as a whole (Huang et al 2003). Blacker (1995) argue that humans will behave differently to responsibilities 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 exists in organization, this is despite the fact that contemporary IS deployed in organizations are intra-organizational in nature and spans across boundaries of the organization (Newell et al 2001). These boundaries that exist in a organization highlight the sub-cultures that may be observed in the organization. IS researchers have highlighted the specifics of subculture in organizations to help give a better understanding of the role of OC in the implementation and managing of IS in organizations.

The integrative concept of OC shows that the organization as having a persistent, consistent and distinct culture across all sub-units (Martin 1992). The integration sub-culture perspective assumes that basic assumptions are shared among organizational staff (Schein 2004), so as value symbols and ritualized practices (Sergiovanni and Corbally 1984). 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 result in no ambiguities existing among members of the system, thus all behaviours and practices are to achieve the same set of goals.
IS researchers such as El Sawy 1985 and Robbins 2000 adopted the integrative subculture perspective in their research. These studies have assumed that OC is homogenous within and across all subgroups and do not specifically address the likelihood for competing culture, conflicts and opposing IT outcomes that may occur among organizational subgroups.

The differentiation perspective focuses on differences within an organization, the unavoidable influence of power and conflicts of interests which leads to a differentiated culture (Pfeffer 1981). 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 (Martin 1992). 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. Von Meier 1999 and Huang et al 2003 have used the differentiated subculture in their study to get a richer understanding of the culture and the use of IS in organizations.

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 (Martin 2002). These ambiguities in the interpretations of manifestations are likely to result in paradoxical or ironic actions and reactions (Kappos and Chivards 2008). They further argue that the ambiguity interpretation that causes the fragmented views in the organization does not suggest any clear cultural or sub-cultural boundaries

within the organization. The paradigm of the fragmented subculture views culture as being shared in an organization will differ by different organizational groups (Loius 1985), 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 to staff having different interpretations with no clear agreement of processes such as the use of IS. There is limited IS research to date that have adopted the fragmented subculture perspective to investigate IS diffusion i.e. at the group level. In fact Huang et al (2003) argue that research should be undertaken in that area to explore the influence of sub-cultural fragmentation in IS implementation. 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.

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).

3   Research Methods

The study will adopt a detailed in-depth case study approach using semi-structured interviews. The case study is a Nigerian Bank and will examine the diffusion of a MIS within the bank. The study will be approached with the premise that sub-cultures exist at the site Martin (1992), and will explore their influence on the diffusion of the MIS. The theoretical sampling technique as suggested by Walliman (2008) will be followed and senior representatives of the bank at strategic, tactical and operational levels will be selected for interview within the IT, Finance, Risk, Marketing, Treasury, HR, Audit, Planning and Development units. The respondents at each of these levels will be able to provide the most valuable insights on the subject matter. This method will ensure validity of generated data because they will be collected from the most knowledgeable respondents in the banks. Each interview will last approximately 45-75 minutes and it will be conducted between December and February 2011. Initial data analysis will follow immediately after that. The interviews will be supplemented with on-site observation, and requesting formal documentation on policies on the use of the MIS. This will enable triangulation of data collected from the interviews. It is anticipated at the time of presenting this paper preliminary analysis will be available to examine how different sub-cultures may impact on the diffusion process of IS in organizations.

4   Anticipated Contribution to Knowledge

The study will provide important new contributions in the use of sub-cultures in the IS diffusion process. Adopting Martin's subculture theoretical lens will shed light on the aspects of different sub-cultures, particularly the fragmentation perspective in organizations and their impact on the process of diffusion of an IS. The fragmentation sub-culture perspective and its role in IS diffusion has not being examined empirically and this research will help fill this gap. The findings from the research will also facilitate a better understanding of issues that hinder the process of diffusion of IS in organizations. The understanding of this problem will enable adopting organizations more effective and efficient in applying the technology into their business operations so as to deliver superior services for their

customers and clients. These insights should help organizations predict how the various sub-cultures may impact the use of an adopted IS. Consequently providing a better chance of getting the best return from the huge investments made in IS.

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