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ACHIEVING IT DIFFUSION WITHIN THE FRAGMENTS –
AN IT CULTURE PERSPECTIVE

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Abstract

Many organizations still fail to make a return from the huge investments they make in implementing complex Information Technology (IT). This is usually due to cultural forces that inhibit the level of usage required to facilitate IT Diffusion. An emerging stream of research highlights the IT culture perspective, a perspective vital for understanding individuals' social practices when they interact with IT. This paper adopted a case study approach to explore how the IT culture perspective may explain how organizational diffusion of an IT may happen despite opposing cultural forces causing a stalemate to the diffusion process. This study identified three IT culture archetypes - embracing, rejecting and confused, depicting a fragmented IT culture during the adaption, acceptance and routinization stages of diffusion of an IT. This study highlights how a salient element of a fragmented IT culture - embracing IT culture archetype could explain how diffusion of an IT happened despite the manifestations of negative IT culture archetypes – 'confused' and 'rejecting' during the diffusion process.

Keywords: IT Diffusion, Organizational Subcultures, IT Culture.

1   Introduction

Organizational diffusion of Information Technology (IT) is vital for the technology to provide some sort of advantage, be it boosting productivity levels or economic advantages to the organization. Streams of research highlight that many organizations still fail to achieve IT diffusion because the level of interactions and usage of the technologies does not facilitate assimilation of the technologies into the organizational settings (e.g. Hsieh and Wang, 2007; Jasperson et al, 2005). IS authors have argued the vital role the organizational culture (OC) concept play in understanding the success and failure factors in the dynamic process of IT implementations in an organization (e.g. Huang et al, 2003; Ravishankar et al, 2011; Rivard et al, 2011). These studies highlights that because implementations of IT are normally across groups in an organization, this would lead different interpretations of the implementation process and hinder the diffusion of the system. However, these studies do not take into account how organizational diffusion of IT may be successful despite cultural forces that suggest a stalemate or opposition. Schein's (1992) definition of OC as the shared beliefs, ideologies, philosophies, rituals, myths, and norms that influence actions taken or behaviors of people in an organization is widely adopted in organizational literature. Research on Organizational Culture (OC) has been able to reveal the impact of social behaviors and outcomes in organizational settings (Nadler and Tushman, 1988), technology transfer practices (Dubé and Robey, 1999), firm effectiveness and performance (Denison and Mishra, 1995). These studies create a link between culture and other variables (organizational processes and productivity), to offer standard direction to organizations about how culture may be managed to ensure organizational success.

An emerging stream of research highlights the IT culture perspective, a perspective vital for the understanding of managing of IT projects. The IT culture perspective helps us understand individuals social practices when they interact with IT, which are normally manifested based on their perceptions of the system (Leidner and Kayworth, 2006; Walsh et al, 2010). The IT culture perspective helps us better understand how " the pervasiveness of IT in users' everyday life blends IT with social practice and brings forward the cultural dimension in IT usage" (Walsh et al, 2010 p. 257). Only a small number of IS empirical studies have considered the IT culture perspective in their research (Walsh et al, 2010) and even fewer have considered IT culture to IT diffusion (e.g. Leidner and Kayworth, 2006). The overall purpose of this research is to understand how organizational diffusion of an IT from the IT culture perspective. Therefore, motivated by the aforementioned concerns, we seek to explore the following research questions: (1) How are IT culture archetypes formed during the implementations of an IT? (2) How do the developed IT culture archetypes influence the diffusion of an IT?

2   Theoretical Foundation

2.1   IT Diffusion in Organizations

It has been noted in IS studies that diffusion is concerned with the outcome (success/failure) of an adopting IT. Venkatash et al (2011) argue that although numerous tactics can be used to encourage the adoption and diffusion of a new innovation into an organization, the long-term viability of it hinges more importantly on users continuance behavior to the system. The major challenge facing the diffusion of an adopted technology is how members of the adopted organization interact with the technology. Many models have been adopted to investigate organizational diffusion of an IT. For example, Cooper and Zmud (1990) proposed an IT implementation model based on the organizational change, innovation and technological diffusion literature. Their model has been able to facilitate an understanding of organizational diffusion of IT by illustrating that diffusion involving six-stages: Initiation, Adoption, Adaption, Acceptance, Routinization and Infusion (see figure 1). The post-acceptance stage i.e. routinization and infusion, highlights that IT usage is beyond users accepting to use the system; it is the continued usage of the system in a way that enhances the productivity of the adopting unit.

Initiation	→	Adoption	→	Adaptation	→	Acceptance	→	Routinization	→	Infusion
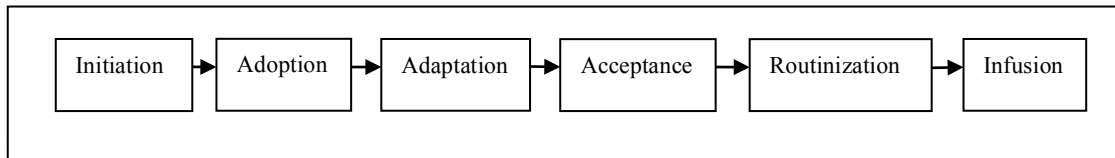
The difficulty to understand the diffusion process of IT in organizations may be due to the existence of users different and uncertain interpretations of IT. This is because organizational stakeholders – Technologists, Users and Management are likely to attribute certain values to IT (Leidner and Kayworth, 2006), especially during the interaction and use of a complex and sophisticated IT. It is important that the different stakeholders behaviors towards an implemented IT are captured and understood. This will enable us better understand the cognitive process of the various stakeholders involved in IT development, implementation and use.

2.2 Organizational Culture and IT Diffusion

Organizational Culture (OC) theories have been adopted in Information Systems (IS) research and used as a significant construct in explaining how organizational members interact with IT innovations (e.g. Orlikowski, 1993; Ruppel and Harrington, 2001). Robey and Boudreau (1999) argue that OC theories helps to shed light on the conflicting consequences that might occur during the implementation of an IT, such as managing the implementation of IT innovations within organizations. Martin's framework of OC (Integration, Differentiation and Fragmentation) have been applied in IS literature to get a richer understanding of culture and the use of IT in organizations (e.g. Huang et al, 2003; Ravishankar et al, 2011; Rivard et al, 2011). These studies taking Martin's perspective of OC highlight how members based on their different subcultures manifest multiple and ambiguous interpretations of an IT implementation process, which negatively affect the diffusion of the technology. However, they have not highlighted how the different subgroup users of IT could manifest cultural assumptions of IT that are not based on their subcultures to form cultural forces that could have significant consequences on the implementations and usage of IT i.e. IT Culture. The IT culture perspective could help provide fresh insights into the understanding of organizational diffusion of an IT.

2.3 IT Culture and IT Diffusion

The concept of the IT culture is an emerging concept in the literature on IT and culture. This concept has been conceptualized in different ways in the literature. Studies by Kaarst-Brown and Robey (1999) and Walsh et al (2011) have investigated the cultural implications of IT and identified IT cultural archetypes in organizations highlighting the emergence of identified cultural archetypes and their consequence on IT management. Kaarst-Brown and Robey (1999) proposed a model in their study that highlighted how five IT culture archetypes ('revered', controlled', 'integrated', 'demystified' and 'fearful') were developed in two organizations. The IT culture archetypes were developed due to the influence of some contextual factors (individual, organizational and societal). Kaarst-Brown and Robey's (1999) model highlight that these contextual factors influence enculturation processes - individual and group socialization, knowledge set attainment, leaders and mythos, which influence the formation of IT culture archetypes, resulting to the initiation of some organizational outcomes e.g. conflict over IT direction, innovation, and the integration of IT with business strategy. Walsh et al's (2011) work is similar to the work of Kaarst-Brown and Robey (1999) by also proposing a framework that identifies nine IT culture archetypes ('studious', 'dangerous', 'passionate', 'interested', 'disciplined', 'frightened', 'disenchanted', 'constrained', and 'dodger') but have gone further to suggest that these cultural archetypes could change or shift (culture creep). Leidner and Kayworth (2006) have preferred to refer to IT culture as IT values - certain values that are attributed to IT by a group, they have suggested that understanding these IT values provides deeper insights on predicting how social groups perceive and ultimately respond to IT-based change

because each organizational stakeholder may attribute certain values to IT. Guzman and Stanton (2009) and Nord et al (2007) have also provided a conceptualization for IT culture similar to that of Leidner (2010), they have argued that it is the culture evident with members of an IT occupation. This IT culture is normally different from the culture of the business group that utilizes the IT artifact (Walsh et al 2010).

Despite the slight variances in the theorizing of the IT culture concept, a consistent theme emerging is that IT cultures are different from culture shared by an occupational group or organizational group. In other words, members within a group with a shared culture may have different interpretations and behaviors in their interaction with IT. This difference in the IT culture held by individuals and their subcultures may be due to fact that the interaction and use of a sophisticated IT innovation could be a mystery for members and even the most skilled technical specialists (Kaarst-Brown and Robey, 1999). This is because unlike IT culture, subcultures are normally based on the occupation of the group. For example, members of a finance subgroup would be expected to subscribe to the value of 'accuracy', so as medical practitioners would be expected to have a subculture of 'caring'. This paper would be adopting the Kaarst-Brown and Robey (1999) and Walsh et al (2011) conceptualization of IT culture where they have investigated the cultural implication of IT usage in organizations and how they have come together to form IT culture archetypes in organizations. Despite the numerous studies of IT diffusion, IT diffusion findings provide little or no guidance on how the cultural implication of people's interaction with IT may influence the diffusion process (Leidner and Kayworth, 2006). Therefore, this conceptualization will enable the investigation of the diffusion process from an IT culture perspective. It was envisaged that by taking this approach, it would be possible to capture the cultural dimension of members' behaviors in their interaction with IT during the diffusion process of an IT. This will help understand the complexity and multidimensionality of behavioral actions that influences the diffusion process of an IT. Also, it will facilitate the shedding of light on the grey area existing in the literature on IT diffusion in organizations. Therefore we integrate the research streams – IT use in organizations and Cultural dimension of IT use in order to provide a rich understanding relating to the features of IT diffusion. In other words, the approach enables the understanding of how actual usage behavior may influence IT diffusion in an organization.

3   Research Methods

The aim was to provide a fresh insight into the theory of IT diffusion by adopting the IT culture perspective so as to help improve the understanding of the existing categories and relationships that occur in IT diffusion. This was achieved by adopting a single case study approach. The interpretive nature of this approach allowed us provides fresh insights in the unexplored dynamics of the phenomenon (IT diffusion) and theoretical concept (IT culture). The single-case study enabled us make sense of data without the risk of oversimplifying the investigated phenomenon and also helped with the rich description of the investigated phenomenon (Siggelkow, 2007). Bunds Bank, a pseudonym, is the organization that we studied. Bunds is a Nigerian-based global bank operating in 21 countries including the UK, France and the US. This facilitated the capture of members' dynamic behaviours and work patterns engendered by the sophisticated strategic and operational processes that would be present in a bank operating in a global business environment. The banking industry is one of the largest implementers of IT amongst industry sectors (Zhu et al., 2004). Banks implement IT to connect their intra and inter organizational operations, a network of relationships characterized as shared and complex. The technological transformation experienced in the banking industry makes the industry an ideal context to undertake research for the explanations of the implications of IS implementations in organizations. The case study method from the IT culture perspective facilitated the capturing of how and why the events and activities that emerged during the diffusion of an IT. Therefore, instead of treating the IT artifact as a static bundle of features, the design of which directly affects how users evaluated it, we viewed each interaction a user had with an IT as the basic unit of analysis that determined adoption and usage behaviors. In other words, rather than assuming that different users utilized an IT in the same way, or that the same user would utilize the system in a constant manner during the diffusion process, we propose as highlighted by (Al-Natour and Benbasat,

2009) that each user-artifact interaction is to be studied separately. The interview process began with IT project managers, while subsequent interviewees were not purposive but a snow ball approach (Patton, 2002), The interviewees were from the Finance, IT and Operations groups of the bank. The sample consisted of people from diverse backgrounds (West and South Africa, Southern Asia and Western Europe). 47 semi-structured field interviews were conducted with key interviewees in the bank's headquarters in Lagos, Nigeria (see table 1). The interviews had a duration range of 30-75 minutes. 44 interviews were tape-recorded and the conversations transcribed. There were follow-up interviews conducted via telephone calls, email correspondence and chats via Black Berry messenger. This was to help clarify comments made by the interviewees. The interviews were conducted between December 2010 and July 2011.

Group	Top Management	Middle Management	Lower Management	Total
1 Finance	5 (1)	11 (8)	6 (3)	22 (12)
2 Operations	3 (1)	7 (4)	7 (2)	17 (7)
3 Information Technology	3 (2)	3 (2)	2 (1)	8 (5)
Total	11 (4)	21 (14)	15 (6)	47 (24)

Table 1.   *Summary of Interviews and Interviewees – December 2010 – July 2011. (*) refers to the number of follow-up interviews via telephone, e-mail or via blackberry messenger services within each interviewee category.*

Following the procedures of Yin (2009), to satisfy the requirements of construct validity, formal documentations in form of the business case for the IT and memos and e-mail correspondence regarding policies for the use of the IT were used as multiple sources of evidence and data triangulation for the study. During the analysis of the interviews, it became evident that the bank's realization of the need to acquire a suitable IT (initiation stage) and the rational justifications considered in adopting the IT (adoption stage) had occurred 4 years prior the period of data collection. Therefore, to reduce the limitation of relying on retrospective interviews, we decided to focus on the events and activities of the IT implementation still occurring and most recently completed. Therefore, this study is focused on the adaptation, acceptance and routinization stages of Cooper and Zmud (1990) IT implementation model. The infusion stage was not considered because at the time of data collection, the system had not being appropriated to that level.

The analysis involved three concurrent activities identified by Miles and Huberman (1994) of data reduction, data display and conclusion drawing/verification. The analysis and coding of the data were done both deductively and inductively. A deductive approach was used to initially code the data using codes related to the research questions and concepts being examined (data reduction). The data reduction method allowed the identification, categorization and description from the large volume of transcripts and notes, the relationships of the themes (IT Diffusion and IT culture) that were frequently, spontaneously or concisely conceptualized by members. The exploratory nature of the research also meant that an element of inductive analysis was also appropriate, to allow unexpected findings to emerge from the data. Thus, the initial coding framework was revised and adapted through a process of inductive analysis to help identify and combine related theoretical themes. QSR NVivo software was used to facilitate the data coding process. The data display activity allowed the data to be sorted and presented into various categories, such as the implementation stages of the IT, use of the IT based on the individual cultural assumptions of the technology. As the study was based on the understanding of IT diffusion, we have used the IT diffusion phenomenon as the core category while relating to it to other category - the IT culture. This has helped to develop a cohesive narrative on elucidating the understanding of the diffusion process of an IT from the theoretical perspective of IT culture. This facilitated in generating a more explanatory power to facilitate the drawing of valid conclusions from the findings in the final stage of the analysis.

4   Results

4.1   IT Diffusion in Bunds Bank

Phoenix, a pseudonym, is the IT studied. Phoenix is a Management Information System (MIS), a three-tier software architecture designed to support the financial and operational departments of the bank. The bank began the design, development and installation of Phoenix in April 2008. These implementation activities were based on the information architecture of the business users (BU), some BU worked with the IT Group in the design of their group's module in the IT. The implementation of Phoenix was completed in July 2009. Phoenix was immediately introduced to members after the implementation and user acceptance tests (August 2009), via members training, awareness and promotion campaigns. The introduction of the IT was to replace old methods of performing organizational tasks. There was strong evidence that some members resisted the system when it was first implemented. A Financial Controller Manager didn't value the system at the time the system was deployed for use. By contrast, the Operations Group was more sympathetic to the system when it was deployed for use. The interviewees talked about when they were about to use the IT in an ordinary manner to undertake their daily and non-routine tasks, the IT had become second nature to them. The IT had become a normal activity for some members using the IT as a daily organization tool for the analysis of financial data for information and report generation depicts the system attaining the routinization stage.

4.2   Organizational Subgroups and Subcultures

Members in the Finance, IT and Operations Groups who had interaction with Phoenix were studied. The subgroups in Bunds bank have their own subcultures i.e. Finance – 'Accuracy', IT – 'Professional & Specialist', Operations – 'Performance'.

4.3   IT Culture Archetypes and the Diffusion of Phoenix

The analysis indicates that irrespective of members' subcultures, members had their own interpretations of Phoenix when they interacted with it. These individual interpretations and attitudes towards Phoenix were similar amongst some members within and across the IT, Finance and Operations subgroups. The similar interpretations and attitudes towards Phoenix across the subgroups coalesced to form three IT culture archetypes – 'Embracing', 'Confused' and 'Rejecting' during Phoenix diffusion. The *'Embracing' IT Culture* describes group of members that were keen to be involved in the implementation of the Phoenix. They took a hands-on approach in their interactions with Phoenix. The embracing IT culture members welcomed the introduction of Phoenix and they enjoyed learning about the system to help simplify their tasks. The *'Confused' IT Culture* reflects a group of members that were unclear of the purpose of Phoenix or were not entirely sure on how to engage with the system to achieve self-efficacy. They seem to have an interpretation of Phoenix not capable of performing the complex analysis of data the system was promoted to be able to do. The *'Rejecting' IT Culture* describes group of members that refused to engage with Phoenix during the implementation process because of the difficulty and complexity they perceive of the system. Most members in this group perceived their requirements had not been fully considered in the design of Phoenix, thus were not motivated to use it.

The IT culture archetypes were informal (Walsh et al, 2011) and were not created by members of the bank but by the authors conceptualization of IT culture archetypes with similar behavioral orientations towards Phoenix. To get a sense of how and why the individual user behaved towards Phoenix, highlighting the IT culture archetype, the procedure of Walsh et al (2010) is followed. They have highlighted IT needs, IT motivation and IT amotivation as vital concepts for interpreting the IT culture of individuals. These would help provide insight on the cultural dimension of IT that was

created. The results also pay attention to the degree of saliency of each of the cultural perspectives during Phoenix implementation. The degree of saliency is identified by members' behaviours that were the most significant as revealed by the IT culture archetypes during attempts by Bunds Bank to diffuse Phoenix into its organizational settings. The elements of the cultural perspectives of the IT implementation and usage are investigated in more detail below, using quotes to describe the activities of the diffusion process.

Adaptation Stage: It was evident in the adaptation stage that a community of members across the subgroups portrayed the archetypal pattern of the 'embracing' IT culture. For example, an IT administrator did feel convinced and assured about how to handle the issues that arose during the design and development of Phoenix. The IT member's technical skills enabled him take on the responsibilities of vital implementation tasks such as writing the necessary scripts for the design of the required modules for end-users on Phoenix. The member felt the core values for being an IT expert would motivate him to demonstrate what was required in the facilitation of the key events and activities of the adaptation stage as expected from end-users: *"I am a technology person, so I have no choice but to prove my worth during the implementation of Phoenix. Senior Programmer (IT Group)"*. Also, the IT group worked in alliance with finance/operation group members in the design and preparation of Phoenix. Thus some end-users across the groups displayed high level of individual innovativeness; they took a 'hands-on' approach, representing the 'embracing' IT culture archetype. The Head of Finance, Bunds Subsidiaries highlighted this: *"With my experience and my qualification in terms of MIS, I think there is nothing I cannot do on Phoenix because I was also part of the team that developed Phoenix"*. Also, the head of e-channels in the operation group also highlighted his involvement in Phoenix adaptation: *"I sat with the team to understand what they were doing and we came up with an idea, as to how we can interface other databases to Phoenix"*. Despite some of the 'embracing' IT culture members (Finance and Operations groups) not in their natural territories during their participative process with the IT group, they participated in practical ways during Phoenix adaptation. These members' actions and behaviours highlighting the 'embracing' IT archetype were salient and had a significant positive implication for Phoenix adaptation.

However, some members had misunderstandings on how Phoenix should be integrated into the bank's existing processes. Therefore, these members manifested the 'confused' IT culture archetype. An informant from the finance group highlight this: *We had problems getting people to map properly for most of the General Ledger case; it was a matter of getting people to understand how the present application would feed into Phoenix and how it works, they had different understanding"*. Comments from a database administrator (DB) in the IT group also suggested there was lack of clarity in how Phoenix would be implemented to end-users specifications. The confusion arose due to the different interpretations IT members had of the Finance/Operation members' requirements. The DB was concerned on how this would affect the implementation of Phoenix: *"I would say everyone has their specializations, it may cause a bit of delay in the development of the scripts required in the implementation of Phoenix, we tend to interpret the business requirements of the users differently which often leads to ambiguities while trying to implement the application"*.

The cultural forces ('embracing' and 'confused') highlight inconsistencies in members behaviours toward Phoenix while attempts were made to adapt it to bank's processes. Similar to work of Von Meier (1999), the inconsistent interpretations and behaviours would create a fraught process while trying to diffuse Phoenix i.e. the progression from the adaptation stage to the acceptance stage. However, because the element of the IT culture archetype – 'embracing' was the most salient IT culture archetype in the adaptation stage compared to the 'confused' IT culture archetype. This would have helped nullify any significant threats the negative attitudinal behaviours from the 'confused' profile would have had towards Phoenix diffusion. Thus elements of the exhibited traits of the 'embracing' IT culture helped Phoenix adaptation to be successful.

Acceptance Stage: When Phoenix was introduced for use, some group of members displayed positive reactions towards Phoenix, manifesting the embracing IT culture archetype. For example, the Head of

Balance Sheet unit in the Finance group highlighted he was not just required to use the system but he needed to use the system. He acknowledged Phoenix because he perceived the need for the system to fulfill specific work tasks: *"I need to use Phoenix not required to use because it is the MIS information source for us. It is sitting on* the core banking application. *So to be able to get asset and liability information I use it to drive those information"*. Similar to the work of Walsh et al (2010), the member had the perceived need to utilize Phoenix to achieve his work functions. Also, the head of e-channels (operations group) displayed 'accepting' orientations when he engaged with Phoenix. He had displayed consistent positive cultural identities in his interaction with Phoenix during the diffusion process. He was happy with the introduction of Phoenix because he perceived ease of use of the system: *"Phoenix is user friendly once it is all defined properly in the design stage i.e. the hierarchy, the way things are, you will get to know the things that are available and you can get to use it. It is not complicated"* The aforementioned examples highlight members that portrayed the 'embracing' IT culture archetype had favourable dispositions by their commitment to utilize Phoenix for organizational work.

Despite some users portraying the 'accepting' IT culture in their engagements with Phoenix, there was a contrasting group that had negative attitudes towards Phoenix. This group representing the 'rejecting' IT culture archetype did not have the motivations to employ Phoenix for organizational work, consequently would have had a negative impact on the diffusion process. A financial controller refused to use Phoenix because he perceived the system presenting erroneous information and not capable of performing financial analysis of his data. Thus, he was not encouraged to commit to the use of Phoenix, actions that would inhibit Phoenix diffusion: *At first when we first started, we noticed that there are some things that are so basic that you thought Phoenix would do and you noticed it is not working as expected, errors and omissions in the figures; you will be disappointed, so you can't use the system.* Similarly, some operation group members refused to employ Phoenix for organizational use. For example, an e-retailing support member of the operations group felt the IT group did not consider their business requirements whilst designing Phoenix. Therefore, exhibited a negative behaviour towards the system: *"I don't know actually what is responsible for this ambiguities, they have their own mappings, their belief is that reports should not be based on single product; it should be based on grouping the products. I made them understand that will not work for us, so they have to look for a way around it. That is the reason why we have not started using it"*. The negative behaviours displayed by the 'rejecting' IT culture archetype are consistent with previous studies that have highlighted conflicts and resistance during IT implementation (e.g. Ravishankar et al, 2011; Rivard et al, 2011).

The 'confused' IT culture archetype was also identified in the acceptance stage. This group of members was fully unsure on how to use Phoenix. Although, they employed Phoenix for organizational use, the functions of the system were sparsely used as they were not sure or understood how to fully engage with Phoenix: *"It is basically understanding the nitty gritty, there are some core definition you need to understand about Phoenix, the uploads, the product names, GL, which basically are different from our GLs. Head Bunds Registrars (Finance Group)"*. Also a Business Operations Support member (operations group) expresses his views: *Maybe because it is new and a lot of people don't know about it yet, maybe we are used to getting our reports from other software application we are used to. So a lot of people are still unsure of Phoenix"*.

This confused group of users understood they needed to use Phoenix but they were doubtful at times of the system, thus engaged with their existing processes and methods. They had only utilized Phoenix to get on with the job i.e. low usage of the technology (Hsiesh and Wang, 2007). The implication of this low usage on Phoenix diffusion was that the system would have dragged from the acceptance stage to the routinization stage. However, like in the adaptation stage, the 'embracing' IT culture archetype was the most salient in the acceptance stage when compared to the 'rejecting' and 'confused' IT culture archetypes. Thus the 'embracing' IT culture archetype had an overall positive influence on the diffusion process. This had a positive impact on facilitating the transition of Phoenix from acceptance stage to the routinization stage.

Routinization Stage: When members were expected to see Phoenix as commonplace, a good number of members across the bank exhibited the 'embracing' IT Cultural features. This allowed these members to use Phoenix in effective ways. The head of the operations group highlighted: *"Because we want to ensure that every decision taking in this organization is based on fact, people are constantly looking for ways to improve the use of Phoenix ".* The 'embracing' IT cultural members took a practical approach and got involved in ways the system could be used effectively. Members of the 'embracing' IT cultural group undertook measures that ensured the improvements in the level of usage of Phoenix that could help the bank to achieve the objective of deploying the system: *"Our usage of Phoenix has actually helped us to improve on the system because you see some other flaws; you see some other things that need to be done, other ways of reporting, how you want to report, flexibility and stuff" - Senior Analyst - Balance Sheet Unit (Finance Group).* The aforementioned quote shows a positive attitude towards Phoenix, which is consistent with previous behaviors, represented by the 'embracing' IT culture archetype in the adaptation and acceptance stages. The 'embracing' approaches taken by the members were to overcome the barriers that could make the use of Phoenix seem extraordinary.

However, some other members representing the 'confused' IT culture archetype were not sure on how to use Phoenix in a sophisticated and routinize manner. This was probably due to the fact that as the expectation for users to utilize a system in a sophisticated and routine manner, ambiguities in use would increase (Von Meir 1999), thus, would affect level of use. A Business Operations Support User did not bother to use the Phoenix as expected despite recognizing the importance of the system because he was unclear how to engage with Phoenix in an effective manner: *I use Phoenix but I still don't analyze data in Phoenix. I export to excel for analysis. I am not sure if we can do complex financial analysis on Phoenix.* A different member in the Finance Group (Head of Bunds Trustees) echoed the above claims: *"We don't know how to use it well, when I say we are having this challenges, we find it difficult to use it effectively probably because we don't know what to do".* The actions of the 'confused' IT culture archetype would negatively affect the extent to which members used Phoenix, as this group of users saw the use of Phoenix as too complex. The behaviors of the 'confused' IT culture group unlike the behaviours of the 'embracing' IT cultural group, would have disrupted the routinizaton of Phoenix and would have a negative impact on Phoenix diffusion. In the routinization stage, the 'confused' IT culture archetype had similar level of saliency with the 'embracing' IT culture archetype. Nonetheless, the 'embracing' IT cultural group was beneficial in routinization of Phoenix as it was evident in the pragmatic and positive approach members took in ensuring they could utilize Phoenix to perform any form of dynamic analysis of data on the system. This highlight the significant influence the positive behaviors had in routinizing the Phoenix, despite the existence of the 'confused' IT cultural profiles.

Members multiple and ambiguous interpretations of Phoenix implementations paints a fragmented picture during the diffusion process. Nonetheless, amongst the cracks are the salient positive elements of the 'embracing' IT cultural archetype against the negative elements – 'rejecting' and 'confused'. Therefore, the 'embracing' IT cultural group were strong enough to facilitate the adaptation and acceptance of the Phoenix to attain the routinization stage. These results suggest that the saliencies of the identified IT culture archetypes during the different stages of Phoenix implementation played a significant role on the diffusion process.

5   Discussion

The analysis reveal how members' different individual behaviors during Phoenix implementation, separate from their subgroups' subcultures coalesced to from the embracing, confused and rejecting IT culture archetypes, representing a fragmented culture in Bunds Bank, but influenced Phoenix diffusion. These IT culture archetypes, different from the subcultures (Walsh et al, 2010), should be expected as Phoenix was implemented. Phoenix was perceived as a complex and advanced technology compared to the previous methods members utilized to manage data and information in Bunds Bank. Members' use of Phoenix was not just based on the organization/groups' beliefs and

values. The members also perceived the need to have used the system based on how they felt the system displayed it attributes and characteristics, interpretations of such attributes and characteristics were anchored on their own characteristics. The characteristics of these members were dependent on their level of IT skills and the belief they had of Phoenix. This study importantly reveals that the social-processual dynamic events and activities of Phoenix implementation manifested elements of the positive of the IT cultural features that helped influenced the diffusion of the technology. This adds to the present understanding of the diffusion process of IT that the events and activities of the process may influence the outcome of the diffusion process i.e. the success or failure.

Leidner (2010) suggested that IT culture although different from an occupational group's culture may also be identified with the occupational group. The IT culture lens highlights how individuals of a collective with a shared group value responded differently to the implementation and use of an IT. The results from this study highlight that members' alliances to subgroups are fickle and subculture relationships are based on operational/occupational need and not deep seated shared cultural assumptions as members across the different subgroups showed similar behaviors towards Phoenix. This has a significant implication on the literature on IT and culture. Most studies have implicitly or explicitly alluded rightly to the role of subcultures in explaining how subgroup members would react to IT implementations (e.g. Huang et al, 2003; Ravishankar et al, 2011; Rivard et al, 2011). However, none of the aforementioned studies examined how the fundamental cultural differences amongst members in their interaction and use of IT impacts the diffusion of an IT. This study highlights that identifying and understanding existing IT cultures which are at the micro level of the organization may be more important in understanding how members react to an IT and explain how diffusion of an IT can be achieved. The results provides insights on how Phoenix diffusion in Bunds Bank reflects the cultural assumptions of 'embracing', 'rejecting' and 'confused' user profiles. This suggests that too much significance should not be attributed to using culture at the organizational or subculture levels as a theoretical lens to investigate the diffusion process of an IT because these levels fail to capture the dynamic and overlapping cultural assumptions of individuals who are engaged with an IT and explain how IT diffusion could happen. Cultural researchers have argued that cultures that have rivalry and ambiguous underlay are considered to be relatively weak cultures because of the existing fragments in the culture (Martin, 1992; Schein, 1992), while strong cultures are evident in homogeneous norms of behavior (Robertson and Swan, 2003). This analysis from the IT culture perspective suggests that within the conflict and ambiguities that occurred during attempts of Bunds Bank members to diffuse Phoenix, there was a positive attitudinal element – 'embracing' IT culture, which was salient during the implementations of Phoenix. This study highlights how a vital element of a fragmented culture can explain how diffusion of an IT could happen despite variances in the interaction of IT creating cultural forces that inhibits the process. In this case, the salient embracing IT culture was vital for the diffusion of Phoenix to the routinization stage in Bunds Bank. This suggests that organizational diffusion of a complex IT requires the understanding of not just organizational subcultures but also understanding the behaviors of individuals towards IT i.e. IT culture.

By capturing individual's cultural assumptions of IT in understanding the diffusion process of an IT, the study has been able to highlight the untapped organizational complexities that created the embracing, rejection and confused behaviors during Phoenix diffusion. This has an implication for practice; we suggest that managers try to recognize the complexities of members' behaviors and attitudes that can be manifested during the diffusion of an IT. For example, some members may be aware of the importance of utilizing an IT for organizational work but they may not be clear on how to effectively engage with the system as it was described by the 'confused' IT culture archetype. Also, the portrayals of the 'rejecting' IT culture archetype may inhibit the potential usage of the system or negatively influence other members that might had initially recognized the benefit of interacting with an IT to achieve their business needs. While the descriptions of the 'embracing' IT cultural archetype may seem a more valuable means in ensuring the development, effective and efficient usage of an IT in organizations. A helpful scenario for the diffusion process would be to have the 'confused' and 'rejecting' IT culture archetypes to change to positive IT culture archetypes like the 'embracing' IT culture archetype. A suggestion to managing and aligning the IT cultural differences might be for

senior management (SM) during IT implementation, is to give bigger responsibilities to members that has positive orientations towards IT, irrespective of their managerial positions. If SM is able to give IT inclined members' irrespective of their managerial positions, bigger responsibilities, this may help promote and influence the usage and diffusion of IT in organizations. They should be encouraged to be actively involved in training, education and awareness campaigns designed for promoting the acceptance and usage of the technology. These initiatives might engender social pressure (Venkatash et al, 2003) which may be helpful for the non-responsive members to develop more positive behaviors toward the usage of an IT because they can see their colleagues who have similar roles to them and not just the IT team interacting positively with the technology. The ability of SM to achieve this may help an adopted IT fit into the functional strategies and overall corporate strategies of their organization, making them more efficient in the ever-dynamic business environments an organization finds itself.

6   Limitations and Future Research

The recommendation that irrespective of members' managerial positions, senior management should give bigger responsibilities to members that have positive attitudes towards IT might be difficult to achieve in the Nigeria context. Hofstede (2001) cultural scale index suggests that Nigeria has a high power distance of 77. To gain more insights, future research needs to explore other cultural contexts where power distance dimensions are low or medium. It is acknowledge that this study adopting a single case method provides deep insights and increase the representativeness of the views of informants regarding organizational diffusion of an IT but limits generalizability. However, we argue that from our empirical results we are able to generalize from empirical statements to theoretical statements i.e. analytical generalizability (Lee and Baskerville, 2003). Further, due to the fact that each of the diffusion process stages of Phoenix (adaptation, acceptance and routinization) had its own peculiar events activities i.e. dynamic, members would interpret the diffusion stages differently. Members may change from one IT culture archetype to another during attempts to diffuse the IT. This is similar to Walsh et al (2010) findings, which they identified IT users exhibiting behaviors of two or more archetype profile i.e. culture hybrids. Further research could explore the dynamic nature of IT culture archetypes during organizational diffusion of an IT. Finally, considering the identified IT culture archetypes were different from the group member's culture this could lead to contribution conflict (Leidner and Kayworth, 2006). Thus, a potential avenue for research would be to explore how the ambiguities between group member's culture and the IT cultures (contribution conflict) may impact the use and diffusion of an IT and enhance the understanding of the underdeveloped theme IT culture.

References

Al-Natour, S. and Benbasat, I. (2009). The Adoption and Use of IT Artifacts: A New Interaction-Centric Model for the Study of User Artifact Relationships. Journal of the Association of Information Systems, 10 (661)

Cooper, R.B. and Zmud, R.W. (1990). Information Technology Implementation Research: a Technological Diffusion Approach. Management Science, 36 (2), 123-139.

Denison. D.R. and Mishra. A.K. (1995). Toward a Theory of Organizational Culture and Effectiveness. Organization Science, 6(2), 204-223.

Dubé, L. and Robey, D. (1999). Software stories: Three cultural perspectives on the organizational context of software development practices. Information and Organization, 9(4), 223-259.

Guzman, I. and Stanton, J. (2009). IT occupational culture: the cultural fit and commitment of new information technologists. Information Technology and People, 22(2), 157-187

Hofstede, G. (2001). Culture's Consequences, 2nd Edition. Sage, Thousand Oaks, CA.

Hsieh, J.J.P. and Wang W. (2007). Explaining employees' Extended use of complex Information Systems. European Journal of Information Systems, 16, 216 – 227.

Huang, J.C., Newell, S., Galliers, R.D. and Pan, S. (2003). Dangerous liaisons? Component-based development and organizational subcultures. IEEE Transactions on Engineering Management, 50, (1), 89-99.

Jasperson, J.S., Carter, P.E. and Zmud, R.W. (2005). A comprehensive conceptualization of post-adoptive behaviors associated with information technology enabled work systems. MIS Quarterly 29 (3), 525–557.

Kaarst-Brown, M.L. and Robey, D. (1999). More on myth, magic and metaphor: cultural insights into the management of information technology in organizations. Information Technology and People, 12, 192.

Lee, A. S. and Baskerville, R. L. (2003). Generalizing Generalizability in Information Systems Research. Information Systems Research, 14 (3), 221-243.

Leidner, D.E. (2010). Globalization, Culture and Information: Towards Global Knowledge Transparency. Journal of Strategic Information Systems, 19(2), 69-77.

Leidner, D.E. and Kayworth, T. (2006). Review: a Review of Culture in Information Systems Research: Toward a Theory of Information Technology Culture Conflict. MIS Quarterly, 30 (2), 357-399.

Martin, J. (1992). Cultures in Organizations. Oxford Univ. Press, Oxford, U.K.

McMaster, T. and Wastell, D. (2005). Diffusion or delusion? Challenging an IS research tradition. Information Technology and People, 18(4), 383-404

Miles, M.B. and A.M. Huberman (1994). Qualitative Data Analysis: An Expanded Sourcebook, 2nd Edition. Sage Publications, London.

Nadler, D. and M., Tushman (1988). Strategic Organization Design. Scott Foresman and Company, Glenview, IL.

Nord, J.H., Nord, G.D., Cormack, S. and Cateer-Steel, A. (2007). IT culture: its impact on communication and work relationship in business. International Journal of Intercultural Information Management, 1, 25.

Orlikowski, W. (1993). CASE tools as organizational change: investigating incremental and radical changes in system development. MIS Quarterly, 17(3), 309-40.

Patton, M. Q. (2002). Qualitative Research and Evaluation Methods. Sage Publications, Thousand Oaks, CA.

Ravishankar, M.N., Pan, S.L. and Leidner, D.E. (2011). Examining the Strategic Alignment and Implementation Success of a KMS: A Subculture-Based Multilevel Analysis. Information Systems Research, 22 (1), 39-59.

Rivard, S., Lapointe, L. and Kappos, A. (2011). An Organizational Culture-based Theory of Clinical Information Systems Implementation in Hospitals. Journal of the Association for Information Systems, 12, 123-162.

Robey, D. and Boudreau, M. (1999). Accounting for the Contradictory Consequences of Information Technology: Theoretical Directions and Methodological Implications. Information Systems Research. 10(2), 167-185.

Ruppel, C. and Harrington, S. (2001). Sharing knowledge through intranets: A study of organizational culture and intranet implementation. Professional. Communication, IEEE Transformational on, 44(1), 37–52.

Schein, E.H. (1992). Organizational Culture and Leadership. Jossey-Bass, San Francisco, CA.

Siggelkow, N. (2007). Persuasion with case studies. Academy of Management Journal, 50: 20–24.

Venkatesh, V., Morris, M. G., Davis, G. B. and Davis, F. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425–478.

Venkatesh, V., Thong, J. Y. L, Chan, F. K. Y., Hu, P. J. and Brown, S. A. (2011). Extending the two-stage information systems continuance model: incorporating UTAUT predictors and the role of context. Information Systems Journal, 21, 527–555.

Von Meier, A., (1999). Occupational cultures as a challenge to technological innovation. IEEE Transaction on Engineering Management, 46(1), 101–114.

Walsh, I., Kefi, H. and Baskerville, R. (2010). Managing Culture Creep: Toward a strategic model of user IT culture. Journal of Strategic Information Systems, 19(4), 257–280

Yin, R.K. (2009). Case Study Research: Design and Methods. 4th Edition. Sage, Los Angeles.