

Spring 3-19-2013

Dynamic capabilities approach to information communication technology adoption in SMEs

Sunday Eze

University of Bedfordshire, sunday.eze@beds.ac.uk

Yanqing Duan

University of Bedfordshire

Hart O. Awa

University of Port-Harcourt

Follow this and additional works at: <http://aisel.aisnet.org/ukais2013>

Recommended Citation

Eze, Sunday; Duan, Yanqing; and Awa, Hart O., "Dynamic capabilities approach to information communication technology adoption in SMEs" (2013). *UK Academy for Information Systems Conference Proceedings 2013*. 8.

<http://aisel.aisnet.org/ukais2013/8>

This material is brought to you by the UK Academy for Information Systems at AIS Electronic Library (AISEL). It has been accepted for inclusion in UK Academy for Information Systems Conference Proceedings 2013 by an authorized administrator of AIS Electronic Library (AISEL). For more information, please contact elibrary@aisnet.org.

Dynamic Capabilities Approach to Information Communication Technology (ICT) adoption in SMEs

Sunday C. Eze and Yanqing Duan

Business and Management Research Institute, University of Bedfordshire

Park Square, Luton, Bedfordshire, LU1 3JU, United Kingdom

Hart O. Awa

Department of Marketing, University of Port-Harcourt, Nigeria

Abstract

Since the 1980s, a substantial number of theories have been developed on ICT adoption. While these theories have contributed extensively in ICT adoption studies, they have always regard ICT adoption as a one-off action and focuses on factors affecting the decision making at one particular decision point. These theories have ignored the fact that as decision to adopt progresses at one particular stage, they may be challenged or influenced by same or different factors across stages. The paper examines the dynamic process of ICT adoption using the concepts of dynamic capabilities and employs a qualitative approach to investigate how UK services SMEs constantly engage in ICT adoption. A framework was derived based on the concepts of dynamic capabilities with a total of 26 interviews and critical adoption factors were unveiled. The findings suggest that using ANT to examine the process of Emerging Information Communication Technology (EICT) adoption helps to unveil the recursive nature of the process and how the factors vary at both single and multiple stages of adoption. This paper presents and discusses the key findings.

Key words: Dynamic Capabilities, Adoption, Small Service SMEs, Emerging ICT.

1.0 Introduction

ICT adoption study is often considered as one of the most mature streams in information systems (IS) research (Brown *et al.*, 2010). This is explained by the availability of cognate theories (e.g., Ajzen and Fishbein, 1980, Davis, 1989; Rogers,

1983; Thong, 1999; Tornatzky and Fleischer, 1990), which have been applied in different contexts. McAfee (2006) accused a substantial number of these ICT studies of relying so much on these theories as if ICT adoption is predictable, straightforward, static and one-off event devoid of uncertainties. Often the theories focus on factors affecting decision at one decision point and under-mind the interplay of the same or different factors as decisions progress (Eze *et al.*, 2011). Scholars assume that most prominent adoption theories are techno-economic and deterministic (Lawrence, 2010; Al-Natour and Benbasat, 2009; Benbasat and Zmud, 2003); they focus attention extensively on distinct roles and some stable characteristics of technology with the least attempt to handle the growing complexities of organizational life characterized by the multiplicity of stakeholders' interests in technology adoption (Barrett *et al.*, 2006). The adoption of EICT in small service businesses happens through a rapid movement of ceaseless backward and forward, and shows a continuous flow of activities (Kim, 2009; Hanseth *et al.*, 2004; Braun and Clarke, 2006; Herold, 2010).

Barrett *et al.* (2006) maintained that over two third (2/3) of IT projects still fail because of over-emphasis on the technologies' rationality (technology directing change) without a corresponding attention on their impacts on people. The society (various human actors) represents the means through which new technologies are produced and reproduced; thus, external forces including trading partners, non-entrepreneurial firms (Parker and Castleman, 2009; Garud and Rappa, 1994), and government agencies play pivotal roles in influencing ICT adoption. Therefore, scholars (Barrett *et al.*, 2006; Jacobsson and Linderoth, 2010) emphasize the need for more social interactive systems as a remedy to the challenges of deterministic system. Literature suggests that the concept of dynamic capabilities is able to unravel these issues as they provide new opportunities and, most importantly, challenge the underlying assumptions upon which most prominent traditional theories of ICT adoption were developed. This perspective is still somewhat ignored or silent in the context of small businesses, despite the increasing complexity of new technology adoption and the more frustrating business environment (Ritchies and Brindley, 2005; Chibelushi and Costello, 2009).

Therefore, immediate research attention is needed to re-evaluate some or all of the stages in the adoption decision process in order to develop a better grasp and new

insights on how UK service SMEs can cope with emerging EICT continually amidst dynamic factors influencing adoption at different stages. The objectives of the study are to unravel how small service firms in the UK adopt and adapt to EICT overtime in order to develop a framework that lays a foundation for studying ICT adoption from a dynamic and evolutionary process perspective; raise awareness on the necessity for examining ICT adoption from dynamic process perspective using more explanatory theories; and to cross-validate extant studies that focused on quantitative approach. On accounts that adoption is dynamic and ongoing, small businesses are supposed to be more strategic in their ICT adoption decisions while recognizing the interplay of changing, but complex and multiple, environmental factors. Thus, providing a single definition of ICT or EICT would be inherently problematic. EICT is defined in this paper as any new ICT development or improved ICT applications. Examples include time tracking devices, customers and operations information, knowledge management systems and document management systems and mobile devices. Finally, the paper addresses the reasons for investigating UK small business sector, examine the concept of dynamic capabilities as the theoretical underpinning, data collection methods and analysis, and discussions.

2.0 UK Service SMEs

Small businesses are key informal socio-economic drivers (Mutuala and Brakel, 2006) and service sector plays pivotal role (Parellada *et al.*, 2011). In most economies, small businesses are expected to grow even more prominent in the near future (Lee, 2004) following digital age induced government encouragement. In European Union and other western countries, small businesses represent about 99 percent of all businesses; they provide entrepreneurial skills, offer about 70% employment opportunities, and provide innovation and gross added value of about 70% (Lindermann *et al.*, 2009; Castro *et al.*, 2010). Scholars (Martin and Halstead, 2004; Tilley and Tonge, 2003; Ritchie and Brindley, 2005) opine that since Bolton Report of 1971 in UK, small sector businesses significantly drive the economy; contributing about 59 percent of GDP and providing regional and local developments. However, the emergence of globalization sets the main difference between the past and the future of service-oriented businesses (Milla and Choi, 2011). This factor as well as global changes such as climate and environmental sustainability tied with the shift toward techno-economic paradigms such as ICT is pivotal in every business.

These raised the role of services and services industries. The UK small service businesses have expanded rapidly in recent years and represents about 20% of the national output (BIS, 2010b). The sector is an essential economic driver that sustains business competitiveness and supports both the private and public sectors. Though significant effort to improve the economy focuses increasingly on the service sector (BIS, 2010b), the sector still operates in a much more complex business environment and still faces challenges keeping up with new technology platforms. Even when small service business owners adopt new ICT application(s), most of them continually accept it only as a short-term solution and ignore the long-term benefits (Rantapuska and Ihanainen, 2008). They are rarely aware that little change in their ICT adoption strategies can lead to competitive maneuverability.

2.1 The Concept of Dynamic Capabilities

Small businesses are usually ill-equipped and sometimes compete with well-established larger firms; their inability to overcome the ordeals of limited resources is critical though their operating agility causes them to leverage their experiences to build solid ICT capabilities (Lin *et al.*, 2012). The less complexity in adoption decision enables small businesses to play faster role in adopting EICT and other corporate innovations than larger firms. Therefore, the thrust of dynamic capabilities lies on building successful competitiveness amidst limited resources and vulnerability to fierce competition (Wang and Shi, 2011). The concept of dynamic capabilities provides theoretical underpinning to the understanding of the evolutionary nature of EICT, since most extant theories are largely deterministic (Eze *et al.*, 2012; Zhang and Fjermestad, 2008) and the concept itself accommodates changing environmental forces. These classical theories rarely assume that ICT adoption is an unpredictable and on-going process that involves leveraging feedback cycles from different stakeholders to build informed EICT capabilities. Rarely, would such theories challenge implementation rather they accept technologies as they are and rely heavily on early adopters or opinion leaderships for diffusion (Andrade and Urquhart, 2010; Rogers, 1995).

The theory of dynamic capability underlines the mutually shaping of stakeholders and reveals situations where SME managers move from a homogenous isolated entity to a

group of reformulated and heterogeneous entity (Millerand and Baker, 2009). Dynamic capabilities define a firm's ability to improve, adapt, adjust, reconfigure, refresh, and renew a business process better than the competitors (Kim *et al.*, 2011). Drawing from other scholars (Helfat *et al.*, 2007; Helfat and Peteraf, 2009), Salunke *et al.* (2011) perceive it as the capability of an organization to purposefully create, extend or modify its knowledge-related resources, capabilities or routines. Implicit is its co-coordinative management process that leads to inter-and intra-organizational learning and helps to reveal dysfunctional routines (Teece and Pisano, 1994). Further, organizations co-create values when they interface with their active clients to develop effective solutions (Salunke *et al.*, 2011; Prahalad and Ramaswamy, 2000; Vargo and Lusch, 2004). Thus, developing and adopting solution require the technical and in-depth knowledge of the clients' organizations and business process. The dynamic capability of an organization is to purposefully co-create with internal and external actors, extend or modify its knowledge-related resources, capabilities or routines to improve effectiveness. The knowledge base of dynamic capability simply means that contemporary organizations rarely go solo (Fordism); they share knowledge contents and foster innovations from outside (post-Fordism) (Prahalad and Ramaswamy, 2000; Gupter and Carpenter, 2009). Professors Prahalad and Ramaswamy's value co-creation and Professors Vargo and Lusch's service-dominant (S-D) logic of marketing stimulated a shift from family business to extended business enterprise, where firms use their skills to attract customer creativity in a holy collaborative network, and to synchronize it with core competencies to build competitive advantage.

Although early research (Teece and Pisano, 1994) found links between dynamic capabilities and competitive advantages, other scholars (Salunke *et al.*, 2011; Cepeda and Vera, 2007) found that consensus is yet to be arrived on the nature of such relationships. Cepeda and Vera (2007) contend that the link in the early definition is tautological since studies claim that dynamic capabilities are linked to profit and corporate growth. The critics of dynamic capabilities rarely understood its different types and application in different contexts (Helfat and Peteraf, 2009; Weerawardena and Mayondo, 2011). Salunke *et al.* (2011) note that dynamic capabilities provide a sound basis for examining the processes through which firms anticipate, and respond to, environmental changes. Anticipation involves spotting out the sources and directions of the change(s) and response involves clear knowledge of the alternatives.

The concept of dynamic capability is relevant in this study because it aids the continual creation and adjustments of organizations' technology and builds competitive advantage based on differentiated services (Weerawardena and Mayondo, 2011). On accounts that SMEs are flexible, unique, associated with complex tasks and operate in a much more dynamic business environment, the concept of dynamic capabilities permits various SMEs to articulate their EICT needs, learn, coordinate, integrate and where possible, challenge and reconfigure their technology's capabilities.

Often researchers develop different theories and concepts or extend existing concepts to understand the phenomenon they are investigating on accounts that studies (VandeVen and Poole, 1995) argue that any theory that assumes ICT adoption and development as unpredictable rarely allows the researcher to understand the negotiation process involved across stages. Thus, previous studies (see Teece and Pisano, 1994; Salunke *et al.*, 2011; Kim *et al.*, 2011) have developed concepts in the area of dynamic capabilities. The study rests on adopting Teece and Pisano's (1994) framework (of integrating, learning and reconfiguring) and using that to explore the capabilities after the preliminary investigation (see section 3.1 for details) and to unveil the factors that influence EICT adoption at both single and multiple stages.

Integration

Otherwise referred to as coordination of resources, integration involves the synthesis of the influence of external knowledge inputs, intangible resources, and tangible capabilities (organization structure, culture, processes and intergroup relationships) in shaping an organization's competitive advantages (see Lin *et al.*, 2012; Teece and Pisano, 1994). Small businesses have trading partners/actors (customers, dealers, suppliers and consultants), who provide updated ideas to capture, align with, and design appropriate EICT. Therefore, dynamic capability is embedded to encourage SMEs to strategically coordinate and combine resources to examine how and why a new technology application may be needed to support existing operation.

Learning

Competitive advantages are driven by intellectual capital and technology; therefore, agility in small business will continually cause growth in EICT adoption as well as recognition for firm's boundaries and environment. Learning is a significant concept

of dynamic capabilities; it assists SMEs to make optimal decisions in their innovative strides (Lin *et al.*, 2012) and reveals dysfunctional routines (Teece and Pisano, 1994). Further, learning is essential to assess innovation's effectiveness in terms of internal and external stakeholders' view on how EICT platforms outperform conventional practices (Becker, 2008; Lopez-Nicolas and Soto-Acosta, 2010). Organization's learning involves knowledge creation, knowledge acquisition, information dissemination, and information interpretation intended to create difficult-to-copy distinctiveness. The more organizations devote time to learn how knowledge is created, the more they are aware of obsolete technology applications that need replacement as well as knowledge that is more critical in developing a new innovation (Lopez-Nicolas and Soto-Acosta, 2010). Scholars (Templeton *et al.*, 2002; Rantapuska and Ihanainen, 2008) show that organization's learning is more relevant to small businesses because their characteristics make adoption a learning process. Small businesses maximize profits by learning how best to adopt and use the EICT especially those that impact on their long-term strategy needs.

Reconfiguring

Studies (Eisenhardt and Martin, 2000; Weerawardena and Mavondo, 2011) argued that dynamic capabilities may be studied in both high and moderate dynamic environment. Lin *et al.* (2012) opine that because business environment changes overtime, integrating and coordination of resources without reconfiguring and transforming them when the need arise rarely yield substantial competitive advantages. Often, change is costly and firms attempt minimizing risks; organizations must scan the environment carefully, develop and adopt new technologies, and reconfigure, recreate and transform resources to the right type of technology innovation ahead of rivals (Teece and Pisano, 1994).

3.0 Methods

This study used qualitative approach to gain in-depth examination of the dynamic and evolutionary process of EICT adoption in UK small service SMEs. Unstructured and semi-structured interviews were conducted in two separate rounds with participants drawn from Crunch Online Data Base and Luton Business Directory. The participating outfits were selected based on the following predetermined criteria- (1) they must have adopted a new ICT platforms in the last three years; (2) they must be

service orientated; (3) staff strength must range from 1 to 250; and (4) they must be operating in England. Since qualitative research emphasizes the discovery and explanation of people's experiences (Schulter and Avital, 2011) and not statistical generalization, purposeful random sampling and snowball sampling were adopted. Snowball sampling was adopted because the initial interviewees introduced other key informants who took part in the interviews.

3.1 Interviews

The initial round of the interview was unstructured, involving a sample of 65 participants drawn based on extended classification of professional service businesses proposed by Ramesy *et al.* (2008) (see table 1). Gilmore and Carson (2007) suggest that unstructured pattern of interview provides an open, flexible, experimental, and revealing pattern of studying complex interactive situations and is often considered the best approach for research in small businesses. In the first round of the interview, 11 participants made up of small business managers, small service sector customers, government agencies, SMEs consultants, and IT vendors agreed to participate. The purpose of the first round of interviews was threefold. First, to understand the current state of E ICT adoption in service SMEs in order to have a broad and unconstrained view; and second, to test the applicability of the key concepts of dynamic capabilities: *integration, learning and reconfiguration* to the initial raw data in order to ascertain the applicability of the concepts to the initial data (see data analysis section for details) or to check the credibility of these concepts. Third, to identify key factors/actors involved in the adoption and the initial set of factors. Unstructured interview provided in-depth determination of key issues here.

A formal letter was sent ahead of time on the purpose of the research and confidentiality of the information. The key questions bordered on unveiling how the participating firms constantly keep up with new ICT at all times. This question was accompanied by other prompt questions during the interview. All the interviews were timed between 45 minutes and 1 hour. Findings from this first round of the interviews helped to develop an initial framework, which guided framing semi-structured interview questions for the second round encounter. In order to enhance, validate, and confirm the outcomes of findings, semi-structured interviews were conducted with 15 key respondents identified in the first round of interviews. The semi-structured

interviews helped in in-depth explanation of participants' social world, experiences, and opinions. The result of the interviews provided rich data for analysis and all the responses were transcribed verbatim in order to elicit deeper meaning from the data. The profile of the participants is presented in table 1 below.

Participants/s upporting cases	Position	Company size	Service
A1	Managing Director	30	Security
A2	Manager	25	Internet marketing and advertising
A3	IT support staff		
A4	IT support staff		
A5	Manager	9	Social media /consultancy
A6	Manager	-	Social network provider
A7	Managing Director	25	IT Vendor /Consultancy
A8	Directors		
A9	Operational Manager	45	Sales and distribution
A10	Managing Director	80	Construction
A11	Manager	5	IT Vendor /Consultancy
A12	Manager	52	Business and Management /Consultancy
A13	Manager/IT support staff	99	IT
A14	Manager	8	Accounting
A15	Developer	1	IT and networking
A16	Designer	1	IT
A17	Test analyst	245	IT Quality control
A18	IT Designer/developer	2	IT
A19	IT Developer	1	IT and networking
A20	IT consultant	11	Consultancy
A21	Small government agencies	-	Education and training
A22	Small government agency	-	Education and training
A23	Small government agencies		Education and training
A24	Small government agency	22	Learning and support services
A25	Small government agencies	-	Support and advisory services
A26	Manager	102	IT consultant/business supports/advice

Table 1: The participants' interview profile

3.2 Analysis

Thematic analysis provided the core skills to transform complex qualitative information. Specifically, hybrid approach which involves theory driven approach and data driven approach was deployed to aid interpretation, communication and more comprehensive grasp of the phenomena investigated. The data analysis involved a partway between inductive and deductive approaches, and the process as shown in figure 1 below is a part of the research design, which reveals how data were generated, analyzed and reported.

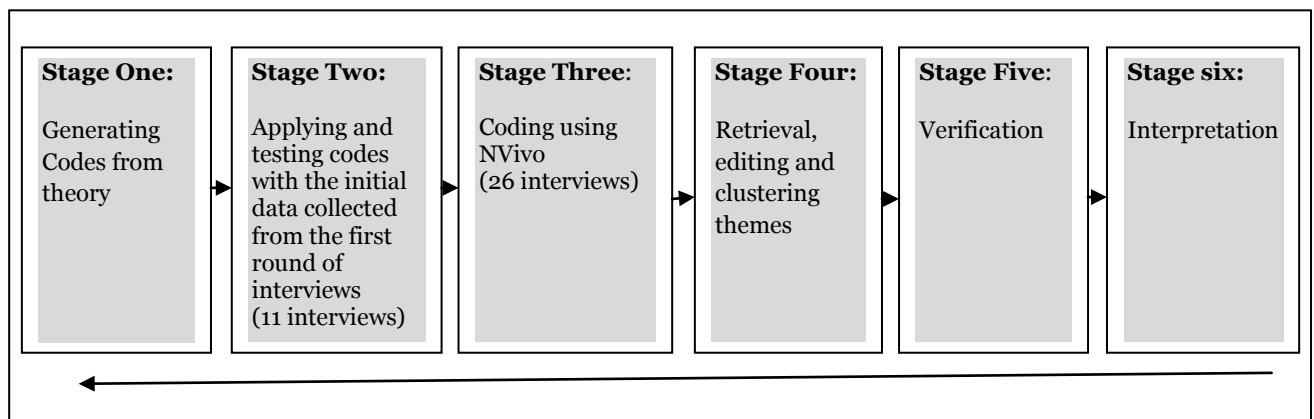


Figure 1: stages of data analysis process

At *stage one*, before the interview was conducted, we reviewed so many theories such as Actor Network Theory, concept of dynamics capabilities and some of the concepts generated from these theories. Thus, these concepts/codes (integration, learning and reconfiguring, framing, framing, translation, stabilization, extend, modify) drawn from extant literatures formed the bases for categorizing the raw data. The definitions and characteristics of these theoretical codes were simplified using (1) code name; (2) the definition of what the codes are; and (3) the description of how to know when themes associated with each code occurs. To ensure that codes generated from theory would be applicable to the raw data in *stage two*, the transcribed interview results in the first round of interviews were manually coded into both pre-defined and post-defined categories and reliability analysis was subsequently measured to ensure that the theoretical codes were credible and would be applicable to subsequent raw data.

Following the preliminary coding process of the first round of the interviews, *four* judges related the quotes to the categories. These judges were colleagues who specialized in qualitative research and information systems as a discipline. The

outcome of the reliability analysis was 88% for the first two judges (see table 2). In *stage 3*, all the transcribed data were treated with Nvivo and retrieved from Nvivo in *stage 4* to permit theoretical and empirical clustering of themes. Bearing in mind that verification in qualitative research is always on an on-going process, further verification in *stage 6* implies another reliability and validity checks. Inter-rater reliability involving percentage agreement (Boyatzis, 1998) with additional two colleagues was adopted for the study considering that fact the data coded were nominal and requires little or no judgments by the coders. The instruments were quite reliable since they internally relate to the factors at levels above Miles and Huberman's (1994) benchmark of 0.70. The reliability analysis table is depicted below.

Scope	Number of judges	Reliability result	
		First two judges	Second two judges
Adoption process	4	0.88(88%)	0.85(85%)
Factors	4	0.89(89%)	0.80(80%)

Table 2: Reliability analysis

In addition, face validity was conducted involving an expert in the field who cross-checked the quotes in relations to the pre- (theoretical) and post- (data driven) codes.

4.0 Findings and Discussion

The adoption of EICT involves a number of processes; to understand how small businesses constantly keep up with such applications involves unraveling situations that shape the entire process through the respondents' own narratives. Our findings presented in table 3 depict the capabilities at each stage of the adoption process and the factors influencing EICT adoption. Themes associated with the findings (EICT stages and factors) were theories driven (Boyatzis, 1998) based on integration, learning and reconfiguration while the factors were data driven and clustered conceptually (Boyatzis, 1998) further based on participants opinion.

Emerging ICT adoption stages and the required capabilities	Supporting cases	Total supporting cases
Code: Integration(I): Problem assessment Concept generation and evaluation Concept specification	A2,A5,A13 A4,A5,A10,A11,A24 A1,A5,A14	A1,A2,A4,A5,A9,A10,A11,A13,A14,A24
Code2: Learning(L) : Role delegation Misalignment and alignment of interest Product trial	A5,A9,A11,A10 A19 A1,A15,A18,A20 A2,A5,A9,A17,A18,A20	A1,A2,A5,A9,A10,A11,A15,A17,A18,A19,A20
Code 3: Reconfiguration(R): Product modification Adaptation Problem redefinition	A1,A9,A13,A19 A1, A2,,A13,A14,A24 A5,A6,A15	A1,A2,A5,A6,A9,A13,A14,A15,A19,A24
Factors		
Factors affecting emerging ICT adoption	Supporting cases	
Awareness of multiple contexts	A6, A9, A11	
Openness to change	A6,A10,A11,A12	
Shared supports	A1, A10, A14	
Integration	A3, A12, A13	
Ease of use	A1, A2, A7	
Safety and security	A1, A9, A14	
Managerial time	A3,A5,A6,A9	
Service quality	A2, A6, A9, A12, A14,A 24	
Customer focus	A5, A10, A11, A13	
Return on investment	A2, A5, A9, A12, A22	
Competition	A1, A9, A10, A12, A13, A15, A24	
Adoption cost	A6, A10, A14, A15	

Table 3: Key activities in each stage of emerging ICT adoption process and factors with supporting cases

Emerging ICT adoption stages and the required capabilities	Samples of supporting evidence
<p>Integration(I):</p> <p>Problem assessment</p> <p>Concept generation and evaluation</p> <p>Concept specification</p>	<p>“looking at the future projections and ...now looking at the past, the company actually sat down and evaluated their business process, evaluated or reviewed where they hope to evolve into(A13)</p> <p>“We come up with a concept and the requirements, then we generate the ideas, we evaluate the ideas and then plan for other people that will join the project” (A5).</p> <p>“The smart patrol is actually built around our specification and that is what we asked for” (A1).</p>
<p>Learning(L) :</p> <p>Role delegation</p> <p>Misalignment and alignment of interest</p> <p>Product trial</p>	<p>“When you have got a problem like that, a middle company or a middle man would help you because I am not sure what I wanted. So I need to talk to somebody that actually specializes in it, so he can sort my brand...they would know because I can’t do that myself” (A10).</p> <p>“In respect of the smart patrol, it was very new and people who did it for us were IT specialists. They find it easy to work out, but their perception of what we wanted was different. So we told them to remove some part. Now it is exactly what we wanted” (A1).</p> <p>“...what we do is for example, with the CRM System, [is] we try them internally, basically it is just one person, myself, and we also try it with three of our clients externally” (A5).</p>
<p>Reconfiguration(R):</p> <p>Product modification</p> <p>Adaptation</p> <p>Problem redefinition</p>	<p>“... the solutions have been developed which is the solution by SAPs... However, when we identify our interests and selected that as the final product, it involved some customization” (A13).</p> <p>“Every day new changes come... and sometimes we are a bit behind learning the skills ...” (A14).</p> <p>“When you are an entrepreneur you need to be able to do things quickly, fail, not necessary fail, but just understand your mistakes and then change them and continue to evolve. You must always have that mentality.”(A6).</p>

Table 4: Key activities in each stage of emerging ICT adoption process with samples of supporting evidence

Integration (I)

EICT is associated with some degree of uncertainty, and often small business managers show consciousness to innovation when they build customized versions that suit their own ideals (internal and external users) and specifics (Swanson and Ramiller, 2004; Teo *et al.*, 2011). Our finding lends support to this subject to the integration of experiences and knowledge of different informed stakeholders. The study proposes three interrelated activities that are associated with integration; they are problem assessment, concept generation and evaluation, and concept specification. Problem assessments happen when existing ICT is no longer meeting the needs for future growth. One participant (SME manager) says:

“Looking at future projection and ...now, and looking at the past, the company actually sat down and evaluated their business process, reviewed where they hope to evolve into and based on that, try to map that into the current solution... and found that what is envisaged ... might not be possible for the current solution...to properly handle the companies processes” (A13). Similar point was raised by a number of participants (A11; A6; A12; A10).

Where recommendations were made, it leads to generating, defining and evaluating the concept as commented by another participant:

“...what we do here...is to come up with new service that we can introduce. Now... is more of a concept. So... what ideas or concepts that we can come out with, that can help introduce a new type of service? ... we generate the ideas; we evaluate the ideas and then plan the project” (A5).

The interviewees propose that concept generation differs slightly amongst small businesses specially in terms of creating competitive advantages that differentiate one from other competitors. This point was supported by some respondents' quotes (A5; A2; A6; A7). A5 notes that the need for engaging in concept specification “...comes from the need to have what we call Intellectual Property (IP); something no one else offers...”

Further, “to achieve this requires incorporating the inputs of other external actors; you [must] bring in the expertise of informed internal and external stakeholders” (A11).

Customers and government play significant role here because ICT is rarely viewed in isolation; rather it involves addressing the basic specification of actors and other interest groups (concept specification). Small businesses exhibit greater closeness to external actors (Herstatt and Hippel, 1992; Gottfrisson, 2011) because aside such actors generating better innovative ideas than external actors of larger organizations, governments themselves actively drive SMEs' investment in ICT (Beckinsale *et al.*, 2006). Although studies (Apulu *et al.*, 2011; Ongori, 2009) show that large organizations play role model for new technology innovation, this study suggests that in most cases small businesses exploit their agility to play prime-movership role in technology innovation:

“We always bring the business intelligent together, what we call those imaginary aspects into it...like a product development, business case, everything from branding to what it should be called, how to distribute it...” (A5).

Learning (L)

EICT may originate from small businesses but learning is necessary to generate experimentation and experiences because they (small businesses) rarely have the required technical skills and other resources to take up the technology innovation to the next level.

Thus, critical issues as problem assessment, concept generation and evaluation, and concept specification may be delegated and ultimately misaligned to handle the long-run interests of stakeholders. Implicit is that although there are two options for adopting EICT (building ICT in-house and outsourcing the ICT), sometimes SMEs end up outsourcing ICT projects for dearth of resources to build ICT in-house. This assertion was supported across cases (A5; A9; A10; A14). One participant said:

“When you have a problem like that, a middle company or a middle man would help you because you are not sure of what you wanted. So you need to talk to somebody that actually specializes in it, so he can sort your brand...they would know because you can't do that yourself” (A10).

Small businesses are better off at outsourcing ICT projects because ICT rapidly changes and employing knowledge IT staff or maintaining existing staff often appears costly.

Another issue that shapes learning is the difference that often arises amongst different actors especially when roles are delegated. Small businesses believe so much in IT consultant; they often think that these consultants are proactive and trustworthy to provide the right information needed to make informed evaluation and decision. Supporting this, Chibelushi and Costello (2009) maintain that the major challenge facing small businesses is the existence of large number of non-proficient consultants that offer advice. They found that 47 percent of the companies still question the level of specialist knowledge being offered by consultants. The finding reveals different ways disagreements occur amongst small business managers and other actors who are integral part of the process:

First, “.... most times the issue we [IT experts] usually have is that [SME managers]...have a fixed idea of what they want (A18).

Second, “...because sometimes the client [SME manager] comes with the different thing which has not been discussed previously. Therefore, during ...negotiation the project continues or ends up here” (A20).

Third, “in respect to the smart patrol, it was very new and people who did it for us [SME manager] were much of IT specialist. They find it easy to work out, but their perception of what we wanted was different” (A1).

There are implications to these outcomes. First, the study suggests that project's success to the next stage seems almost uncertain. Therefore depending organisations, small business managers may ignore the initial experts and consider new experts that may adhere to their interests, values and norms, where such conflicts persist. Second, key actors in most case were not clear on how they intend to achieve their ICT adoption goals and try to go back to re-learn and reassess what might best meet their need. The negotiation between most SME managers and other experts at this stage is unpredictable. The finding suggests that such negotiation is only successful where there is agreement between the key actors and others in the process. Such agreement often results to technology development, evaluation/trial. As noted by one SME manager:

“...what we do is for example, with the CRM System [is] we try them internally, basically is just one person, myself, and we also try it with three of our clients externally” (A5).

This was supported by A2, A9, and A18. Note that organisational structure and culture may significantly affect the extent of evaluation. Organisations that are open may require several other actors in the evaluation exercise. Although this amongst organisations, participants note that though EICT may be evaluated, it may not always be up to the standard envisaged and therefore, requires further adjustment. This suggests that there are constant challenges and movement of actors resulting to further learning and experimentation. Involving diverse actors may not always promote new ICT rather; it may hold back key actors from engaging in technology adoption/development. One of the advantages of this is that small business managers that are innovative may consider developing and/or adopting any new innovation only when it is conducive in terms of being in line with actors' requirements.

Reconfiguration(R)

Reconfiguration takes place when new ICT did not compatibly conform to existing organizational arrangements. Garud and Rappa (1994) note that every firm has standards and the more a piece of technology conforms to the required evaluation criteria and organization requirements the more valuable it is to the users. Furthermore, Attaran and Attaran (2002) emphasize that customization of ICT usage enables an organization to create optimally and efficient information resources. In most cases, customization is made in order to enhance small businesses' appeal. Evidence shows that EICT standards are not always achieved initially. This point was raised by a participant:

“... the solutions have been developed which is the solution by SAPs, which is off the shelf. However, when we identify our interests and selected that as the final product; it involved some customization” (A13).

Modification was a fundamental activity various actors considered to ensure that the features of the new ICT are reliable and efficient. The study revealed that organizations that down played employees' inputs in technology change may be ignoring the strategic and functional aspects of job satisfaction as well as competitive

advantage following reduction in adoption time. A participant notes that: "as the operations manager, in that case I don't need to ask the employees, I am in a position to make that decision because I know what it will benefit the business." (A9). Similarly, Tyre and Orlikowki (1994) note that employees who develop interests toward a routine behaviour rarely shift grounds with ease. This implies that employees in most cases are dissatisfied with the new ICT, thereby leading to their resistance to switch from the old to the new ICT. "...another challenge was staff... resistance" (13). However, evidence suggests that adaption may happen where there is a substantial training and ongoing support:

"When you implement the program there need to be training, adequate training and on-going support as well until people feel confident" (A24).

Furthermore, it was revealed that as emerging technology advances and for businesses to continue to evolve, there is a need to adapt continually to meet the changing needs of the business environment. This issue was raised (A6) and supported by a number of participants (A1; A4; A8; A7):

"When you are an entrepreneur you need to do things fast, without necessarily ignoring change factors; understand your mistakes and then change them and continue to evolve. You must always have that mental alertness" (A6).

This triggers managers to reconsider their EICT adoption decisions and to reevaluate some or the entire adoption process:

"... we are already looking for the other technology probably because there are other things that are better...I am looking at the next evolvement of the whole process" (A1).

Thus as technology evolves, organizations continually look for new applications that would meet their needs. Walden and Browne (2009) contend that ICT evolves rapidly, getting to a time stable equilibrium would be achieved.

4.1 EICT Adoption Framework

Classical theorists (Ajzen and Fishbein, 1980; Davis, 1989; Rogers, 1995) considered ICT adoption from static, linear and utilitarian perspectives. While these perspectives spurred scholarly interest, they have been challenged for neglecting the complex

activities of SMEs and most importantly the multiplicity of stakeholders involved in the process. Therefore, this study proposes that such perspective should be replaced with iterative, spiral, systematic and people-centered models. Figure 2 depicts the framework and helps to account for how the factors were clustered within each stage or multiple stages of the adoption process. Drawing on the finding, the study reveals that the perception of various stakeholders involved in ICT adoption differs from one stage to another, thereby making adoption process an iterative and on-going. The various internal and external stakeholders (small government agencies, IT experts, consultants) involved in establishing EICT adoption are interwoven and cannot be viewed in isolation. Evidence reveals that integration (I), learning (L) and reconfiguration (R) in the process make SMEs managers better informed, sophisticated and more responsive to environmental dynamics. I, L and R in the framework represent the three stages, while IL, LR, IR and ILR in the framework represent multiple stages in the framework. The framework below is used to rate the factors that affect the stages based on respondents' opinions at both single and multiple stages.

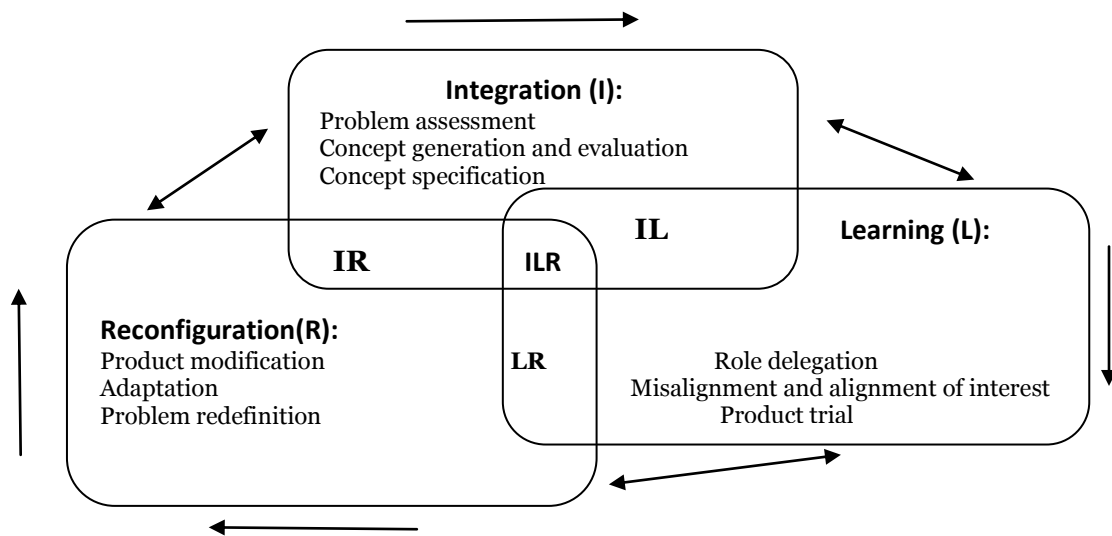


Figure 2: EICT adoption framework

4.2 Intervening factors in the dynamic process of EICT adoption

Adoption is a dynamic process; therefore, the figure depicts critical factors influencing EICT adoption at single and multiple stages. It is important to note that although some of these factors may have been identified in previous studies, the study demonstrates that these factors do not influence adoption decisions at one particulate point rather it

can influence adoption at various stages as decisions are made and challenged along the process overtime.

Single stage factors			Multi stage factors		
I	L	R	IL	IR	ILR
Awareness of multiple context	Safety and security	Service quality	Openness to change	Competition	Return on investment
	Integration		Shared support	Customer focus	Ease of use
					Managerial time
					Adoption cost

Table 5: Factors influencing adoption at single and multiple stages

5.0 Conclusion

This paper proposes a conceptual framework informed by resource-based view of the firm and specifically explored the dynamic and evolutionary processes of adoption and implementation of EICT in small businesses. The framework provides lenses that explain and predict EICT adoption process and change outcomes characterized by conflicting interests of stakeholders. ICT adoption has moved from a simpler participation process to a complex and on-going process, involving the interplay of human and non-human actors. The concept of dynamic capabilities provide a powerful and explanatory framework that reveals key capabilities involved in EICT at each stage and why and how the roles and factors vary across stages. Our proposed framework provides the bases for understanding the actors, their roles and the factors in the stages. The key activities in the framework are crucial in tracing how small businesses keep up with EICT adoption overtime. On accounts that adoption is a continuous process, the decision to adopt is made and challenged in one stage or the other and the factors that influence adoption process also vary from amongst stages. The factors that linked to all the stages include return on investment, ease of use managerial time and adoption cost, followed by openness to change, shared support, competition and customer focus. These factors have profound impact on small business managers' and other stakeholders' decision to adopt EICT.

5.1 Implications for practice

Practically this study is insightful to actors in tracing, learning, and understanding the degree to which their values, knowledge expectations and interpretation of EICT, and organizational change affect adoption decision. Actors can use the framework to estimate the possible values and interests of co-actors in the adoption process. On the other hand, the framework guides those who oppose or resist the adoption on how to restrain the adoption especially where the ICT is sub-standard. EICT adoption requires alignment of other human actors to key actors' interests. The study reveals that IT experts, vendors, consultants and other actors involved in the process must focus their attention on the key actors' arrangement to ensure that goal relates to key actors' views and mindset. This has the possibility of reducing conflicts and time spent in deploying EICT as well as creating goal congruence. Based on reviewing and analyzing the state-of-nature of these stakeholders in the adoption process, managerial decisions improve and unanticipated changes are coped with.

5.2 Limitations and further study

While this study emphasizes on the need to consider ICT adoption from a dynamic process perspective, there are a number of limitations. First, small sample size as well as the scope of the factors presented is limited to the sectors concerned; thus, other factors may be prevalent to other sectors. Second, qualitative research is interpretive and subjective in nature and the limitations in the sample used are common in qualitative research. The generalization of the findings and the framework remain to be established across a wider population. Third, the study interviewed both end users of ICT and other stakeholder, without focusing on a specific EICT. While this may be criticized by other researchers who may investigate a specific ICT, we believe that adoption is an ongoing action and managers respond to environment and the interplay of multiple stakeholders.

The diverse actors vary in terms of the factors they view critical in influencing EICT. There might be other factors that are prevalent to other sectors that may provide researchers alternative ways of analyzing and viewing these factors. A further study is essential to replicate the measures and instruments of this study. Further, the current research contributes by raising awareness of the challenges posed by the rapid change in ICT. The study explored the notion that ICT adoption is unpredictable and

evolutionary. Further research is needed to examine how ICT changes and how organizations constantly keep up with it. Such studies might explore more specifically, how such change affects SMEs and why keeping up with new ICT appears to be challenging for SMEs. An understanding of how ICT changes and the best way to deploy them help to explain the best mechanisms to adopt overtime.

References

- Ajzen, I. & Fishbein, M. (eds.) 1980. *Understanding attitudes and predicting social behaviour* New Jersey: Prentice-Hall.
- Al-Natour, S. & Benbasat, I. 2009. The adoption and IT artefacts: A new interaction-centric model for the study of user artefact relationships. *Journal of Association for Information Systems*, 10(9), 661-685.
- Andrade, A. D. & Urquhart, C. 2010. The affordances of actor network theory in ICT for development research. *Information Technology and People*, 23(4), 352-374.
- Apulu, I., Latham, A. and Moreton, R. 2011. "Factors Affecting the Effective Utilization and Adoption of Sophisticated ICT Solution: Case Studies of SMEs in Lagos, Nigeria," *Journal of Systems and Information Technology*, Vo. 13 No. 2, pp. 125-143.
- Attaran, M. & Attaran, S. 2002. Collaborative computing technology: the hot new managing tool. *Journal of Management Development*, 21(8), 598-609.
- Barrett, M., Grant, D. & Wailes, N. 2006. ICT and organisation change: Introduction to special issue. *The Journal of Applied Behavioural Science* 42(1), 6-22.
- Becker K. 2008. Unlearning as a driver of sustainable change and innovation: Three Australian case studies. *International Journal of Technology Management*, 42(1/2), 89-106.
- Beckinsale, M., Levy, M. & Powell, P. 2006. Exploring Internet adoption drivers in SMEs *Electronic Markets*, 16(4), 361-370.
- Benbasat, I. & Zmud, R. W. 2003. The identity crisis within the IS discipline: Defining and communicating the discipline's core properties. *MIS Quarterly*, 27(2), 183-194.
- Bis 2010b Professional and business services-a 2020 vision for growth <http://www.bis.gov.uk/assets/biscore/business-sectors/docs/10-798-professional-business-services-2020-vision-for-growth>,
- Boyatzis, R. 1998. *Transforming qualitative information: Thematic analysis and code development*, London, Sage Publication Ltd.
- Braun, V. & Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Brown, S. A., Dennis, A. R. & Venkatesh, V. (2010). Predicting collaboration technology use : Integrating technology adoption and collaboration research. *Journal of Management Information Systems*, 27(2), 9-53.
- Castro, M. L., Montoro-Sanchez, A. & -De-Urbina-Criado, M. O. 2010. Innovation in service industries: Current and future trend. *The Service Industries Journal*, 31(1), 7-30.
- Cepeda, G. & Vera, D. 2007. Dynamic capabilities and operational capabilities: A knowledge management perspective. *Journal of Business Research*, 60(5), 426-437.
- Chibelushi, C. & Costello, C. 2009. Challenges facing W. Midlands ICT -oriented SMEs. *Journal of Small Business and Enterprise Development*, 16(2), 210-239.
- Davis, F. 1989. Perceived usefulness, perceived ease of use and acceptance of information technology. *MIS Quarterly*, 3(3), 319-340
- Eze, S., Duan, Y. & Jackson S. (2011). Understanding The dynamic process Of emerging ICT adoption In UK service SMEs. *Proceeding of the 16th Annual Conference 2011 UK Academy for Information Systems*. Oxford UK.
- Eze, S., Duan, Y. & Chen, H. (2012). Factors Affecting Emerging ICT Adoption in SMEs: An Actor Network Theory Analysis. *International Conference on E-business Technology & Strategy (ICETS)*. Tanjin, China.
- Garud, R. & Rappa, M. A. 1994. A social -cognitive model of technology evolution: the case of cochlear implants. *Organisation Science*, 5(3), 344-362.

- Gilmore, A. & Carson, D. 2007. Teaching and research in small business enterprise marketing :A critique and some alternatives. In: HINE, D. & DCARSON (eds.) *Innovative Methodologies in Enterprise Resarch*. Cheltenham UK: Edward Elger.
- Gottfrisson, P. 2011. How small companies generate ideas for new services. *Intarnational Journal of Business and Social Science*, 2(10), 101-111.
- Hanseth, O., Aanestad, M. & Berg, M. 2004. Guest editor' Introduction:Actor network theory and information systems. What 's so special? . *Information, Technology and People*, 17(2), 116-123.
- Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M. A., Singh, H. & Dj Teece D.J. Et Al. 2007. *Dynamic capabilities :Understanding strategic change in organisations*, Malden, M.A, Blackwell Publishing.
- Helfat, C. E. & Peteraf, M. 2009. Understanding dynamic capabilities:Progress along a development path. *Strategic Organisation*, 7(1), 91-102.
- Herold, D. K. 2010. Imperfect use?ICT provisions and human decisions:An introduction to special issues on ICT adoption and user choices. *The Information Society*, 26,243-246.
- Herstatt, C. & Hippel, E. V. 1992. From experience:Developing new product concept via the lead user method:A case in a low -tech field *Journal of Production Innovation Management*, 9,213-221.
- Jacobsson, M. & Linderoth, H. C. J. 2010. The influence of contextual elements,actors frame sof references and technology on the adoption and use of ICT in construction projects:a Swedish case study. *Construction Mnagement and Economics*, 2813-23.
- Kim, G., Shin, B., Kim, K. K. & Lee, H. G. 2011. IT capabilities,process-oriented dynamic capabilities and firm financial performance. *Journal of the Assocation for Information Systems*, 12(7), 487-517.
- Kim, S. S. 2009. The intergrative framework of technology use:an extension and test. *MIS Quarterly*, 33(3), 513-537.
- Lawrence, J. 2010. The factors that influence adoption and usage decision in SMEs: Evaluating interpretive case study research in information systems. *The Electronic Journal of Business Research Methods*, 8(1), 51-62.
- Lee, J. 2004. Discriminant anlysis of technology adoption behaviour:A case of internet technologies in small business. *Journal fo Computer Information Syetems*, 57- 66
- Lim, J.-E., Dehning, B., Richardson, V. J. & Smith, R. E. 2011. A meta analysis of the effects of IT investment on firm finanacial performance. *Journal of information systems*, 25(2), 145-169.
- Lin, S., Miao, Q. & Nie, K. 2012. A case study on entrepreneurship for sustained Innovation. *African Journal of Bsuiness Management*, 6(2), 493-450.
- Lindermann, N., Valcarcel, S., Schaarschmidt, M. & Kortzfleisch, H. V. (eds.) 2009. *SME 2.0:Roadmap toward Web 2.0 open innovation in SME-networks-a case study based research framwork*, Boston: Springer publishers.
- Lopez-Nicolas, C. & Soto-Acosta, P. 2010. Analyzing ICT adoption and use effects on knowldge creation:An emperical investigation in SMEs. *International Journal of Information Management*, 30,521-528.
- Mcafee, A. P. (2006). Enterprise 2.0: The dawn of emergent collaboration. *MIT Slogan Management Review*, 47(3), 21-28.
- Miles, M. & Huberman, A. 1994. *Qualitative data analysis:An expanded sourcebook*, Thousand Qaks,California, Sage Publication Ltd.
- Milla, C. J. M. & Choi, C. J. 2011. The innovation feature of service industries:(Anti-) globalisation and commensuration. *The Service Industries Journal*, 31(1), 21-38.
- Mutuala, S. and Brakel, P. 2006. "E-readiness of SMEs in the ICT Sector in Botswana with respect to Information Access," *The Electronic Library*, Vol. 24 No. 3, pp. 402-427.
- Ongori, H. 2009. "Role of Information Communication Technologies Adoption in SMEs: Evidence from Botswana," *Research Journal of Information Technology*, Vol. 1 No. 2, pp. 93-104.
- Parellada, F. S., Sorian, D. S. & K-Lhuarng 2011. An overview of the service industries future priorities:Linking past and future. *The Service Industrial Journal*, 31(1), 1-6.
- Prahalad, C. and Ramaswamy, V. 2004. "Co-creating Unique Value Customers," *Journal of Strategy and Leadership*, Vol. 32 No. 3, pp. 4-9.
- Rantapuska, T. & Ihanainen, O. 2008. Knowldge use in ICT investment decision making of SMEs. *Journal of Enterprise Information Management*, 21(6), 585-596.
- Ritchies, B. & Brindley, C. 2005. ICT adoption by SMEs:Implication for relationships and management. *New Technology,Work and Employment*, 20(3), 205-217.
- Rogers, E. 1995. *Diffusion of innovation*, New York: Free Press.
- Salunke, S., Weerawardena, J. & Mccoll-Kennedy, J. R. 2011. Toward a model of dynamic capabilities in innovation -based competitive strategy:Insights from project-oriented service firm. *Industrail Marketing Management*, 40,1251-1263.

- Schultze, U. and Avital, M. 2011. Designing Interviews to Generate Rich Data for Information Systems Research. *Information and Organisation*, 21, 1-16.
- Swanson, E. B. & Ramiller, N. C. 2004. Innovating mindfully with information technology. *MIS Quarterly*, 28(4), 553-583.
- Teece, D. & Pisano, G. 1994. The dynamic capabilities of firms: An introduction. Laxenburg: International Institute for Applied Systems Analysis.
- Templeton, G. F., Lewis, B. R. & Snyder, C. A. 2002. Development of a measure for the organizational learning construct. *Journal of Management Information Systems*, 19(2), 175-218.
- Teo, T. H. S., Srivastava, S. C., Ranganathan, C. & Loo, J. W. K. 2011. A framework for stakeholder oriented mindfulness: Case of RFID implementation at YCH Group, Singapore. *European Journal of Information Systems*, 20201-220.
- Thong, J. (1999). An Integrated Model of Information Systems Adoption in Small Business. *Journal of Management Information Systems*, 15(4), 27-31.
- Tilley, F. & Tonge, J. 2003. Introduction. In: TILLEY., F. & TONGE, J. (eds.) *Advantages in SME: Organising for Innovation and Change*. England: John Wiley and Sons Ltd.
- Tornatzky, L. and Fleischer, M. 1990. *The Process of Technology Innovation*. Lexington, M.A.: Lexington Books.
- Tyre, M. J. & Orlikowski, W. J. 1994. Window of opportunities: Temporal pattern of technological adaptation in organisation. *Organisation Science*, 5(1), 98-118.
- Vargo, S. and Lusch, R. 2004. Evolving to a New Dominant Logic for Marketing. *Journal of Marketing*, Vol. 68(January), pp. 1-17.
- Vandeven, A. H. & Poole, M. S. (1995). Explaining development and change in organisation. *Academy of Management Review*, 20(3), 510-540.
- Walden, E. A. & Browne, G. J. 2009. Sequential adoption theory: A theory for understanding herding behaviour in early adoption of novel technologies. *Journal of the Association for Information Systems*, 10(1), 31-62.
- Wang, Y. & Shi, X. 2011. Thrive ,not just survive: Enhancing dynamic capabilities of SMEs through IS competence. *Journal of Systems and Information Technology*, 13(2), 200-222.
- Weerawardena, J. & Mavondo, F. T. 2011. Capabilities, innovation and competitive advantage. *Industrial Marketing Management*, 40,1220-1223.
- Zhang, S. & Fjermestad, J. 2008. Instant Messaging: Observations from two small e-commerce busines. *Journal of Enterprise Information Management* 21(2), 179-197