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# UNDERSTANDING THE DYNAMIC PROCESS OF EMERGING ICT ADOPTION IN UK SERVICE SMEs

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## **ABSTRACT**

*This paper reports on research in progress which aims to help service SMEs benefit from the application of emerging ICT by examining the dynamic process of technology adoption using Actor Network Theory (ANT). It is argued that the adoption of emerging ICT should be examined from a dynamic process perspective. Traditional adoption theories developed by previous researchers (e.g. Ajzen and Fishbein 1980; Davis, 1989; Rogers, 1993) have contributed to technology adoption studies in the past, but they have limitations in capturing constant technology advancements and the dynamic and evolutionary nature of technology adoption. This study adopted a qualitative approach to investigate how service SMEs are engaged in emerging ICT adoption by focusing on the adoption process, the role of key actors and critical factors. A research framework was proposed based on ANT. The framework was initially tested using interviews with SME managers involved in the ICT adoption process. Eleven interviews in eight service SMEs have been carried out and data collected has been analysed using content analysis. The preliminary findings suggest that using ANT to examine the process of emerging ICT adoption in service SMEs helps to unveil the dynamic nature of ICT. The initial framework also has potential to help identify the interactions and contributions of key actors during the adoption and post adoption process.*

## **KEYWORDS**

ICT adoption, Emerging ICT, Actor Network Theory, Service SMEs

## **1. INTRODUCTION**

Organisations are constantly undergoing a dramatic change in all spheres of their business activities (Nissan et al 2011). More specifically, the UK small business service sector is witnessing a period of rapid growth and transformation. The success of such transformation is not only fuelled by ICT; but also dependent on the ability of SME's to adopt emergent ICT applications to streamline and improve business efficiency (Nissan et al 2011). In the context of this study, emerging ICT is defined as improvisations made to current ICT systems or the adoption of new applications which are not originally anticipated by management. Despite the potential of emerging ICT for SMEs, present studies have taken for granted how and why service sector SMEs are adopting emerging ICT applications and if such adoption is enhancing efficiency and service delivery (Ramsey et al 2008). Although, a number of studies (Ajzen and Fishbein 1980; Davis 1989; Porter, 1985) have investigated how and why organisations adopt ICT, they have been criticised as being static in nature and not able to capture the constant and continuous nature of ICT adoption in SMEs (Al-Natour and Benbasat 2009). Furthermore, most of these theories focus more on the technical aspects of the adoption process with less emphasis being placed on the role of human agency (Barrett et al 2006). It is argued that appropriate frameworks are needed to shed light on depicting the dynamic and evolutionary process of emerging ICT adoption in SMEs, its associated challenges and the factors that influence its adoption and use over time. This research aims to help UK service sector SMEs benefit from emerging ICT by viewing ICT adoption as a dynamic process using Actor Network Theory (ANT). It focuses on the adoption process, the role of various actors and associated critical factors.

## **2. THEORETICAL FOUNDATION**

Actor Network Theory (ANT) was adopted for this study to understand both the evolutionary and emergent nature of ICT. ANT attempts to address the role technology plays in a social setting and the process by which the technology bilaterally influences the social setting over time (Mahring, 2004). The theory rejects both the philosophy of technology and social determinism (Latour, 1987; Faraj et al 2004; Hanseth et al 2004), for downplaying the ongoing and dynamic interaction

between social and technological factors. In other words, social and technological systems should not be studied in isolation. Hence, ANT is selected for this study as it allows for an examination of the dynamics between key actors involved in the ICT adoption process and also the interplay between social and technological systems (Latour, 1987; Cordella and Shaikh, 2006). Key ANT concepts; including - *inscription, translation, framing and stabilisation* were adopted in conceptualising the framework for this study. Each concept is now briefly reviewed:

**Inscription:** The process whereby actors form (enact) values, interests and beliefs towards technology (Sarkker et al., 2006). Inscription is often influenced by organisations beliefs, previous patterns of IT use and expectations over what the technology is about and can do (Faraj et al 2004; Kim 2009; Allan, 2004).

**Translation:** The process of aligning numerous interests and/or beliefs of different actors with that of the key actors within the network (Sarkker et al., 2006; Callon, 1986). It involves understanding how actors seek the interest of other human actors or convince others, directly or indirectly, in adopting new technologies (Callon, 1986; Faraj et al 2004; Gao, 2005; Sarkker et al 2006; Tatnall and Jerzy, 2003)

**Framing:** Recognises that actors not only inscribe beliefs, interests and values over technology, but such values may be dissimilar and detached from one another (Faraj et al 2004).

**Stabilisation:** The disappearance of problems where the relevant actors consider the problem as being solved (Bijker et al 1989). Stabilisation of technology does not self-evidently mean that technology is not amendable. Indeed, technology and business processes might change or adjust over time or as Bijker et al (1989) puts it “*closure by redefinition of a problem*”.

### **3. RESEARCH METHODS**

The empirical evidence of this study will be gathered using a qualitative approach. The main objectives are to provide a rich descriptive account of the process and activities involved in adopting emerging ICT.

The research will be carried out using two stages.

- The *first stage*, involved the use of both *open ended* and *semi-structured* interviews to generate the initial data and explore the suitability of ANT in conceptualising the evolutionary stages of emerging technology, identify key important actors and critical factors.
- The **second stage**, will involve *semi-structured interviews* to help unveil the activities and key actors identified during development of the initial framework. This will help validate all aspects of the framework including the key factors influencing continuous adoption and/or development of emerging ICT. Where necessary, the initial framework will be adjusted and enhanced.

Content analysis consisted of using inductive thematic analysis on the interview data. Nvivo software will be the main analytical tool for the content analysis.

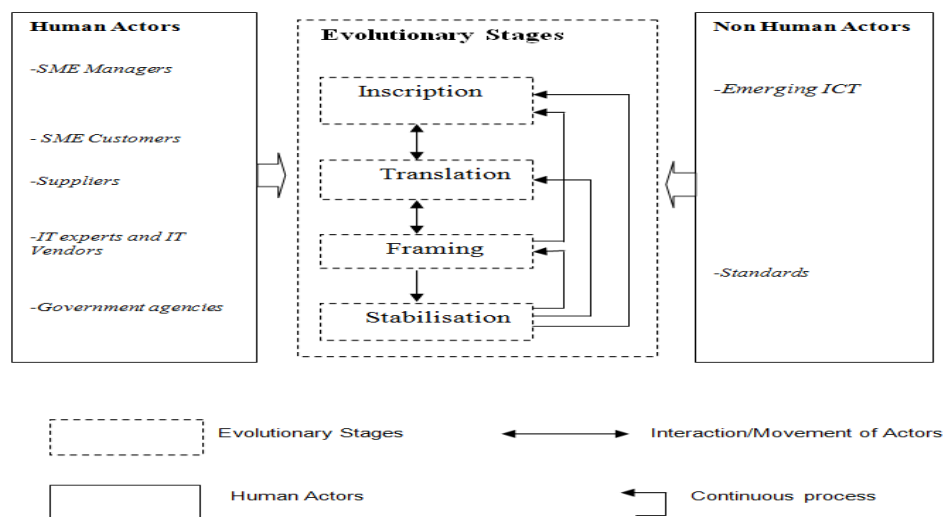


Figure 1. Research Framework

## 4. RESEARCH FRAMEWORK

A conceptual framework (see figure 1) was established through the preliminary interviews and initially confirmed with pilot interviews in eight SMEs. Key actors

involved in the ICT adoption process included: SME managers, SME customers, IT experts, IT vendors, Suppliers and Government agencies. Non-human actors included emerging ICT and technology standards. The framework illustrates that the evolution of emerging ICT and its adoption and /or redevelopment is not a one-off event; rather it is a continuous process (Kim, 2009). In other words, ICT adoption is an iterative process which is formed and reformed by actors within the network. This process may also be limited or become hindered if there is disagreement/resistance among members of the network. Therefore, the process may cease to continue at any stage leading to re-evaluation of some or all of the stages involved. The preliminary findings from interviews suggest that using ANT to examine the process of emerging ICT adoption in SMEs has helped to unveil the dynamic nature of ICT and its adoption and use by SMEs. The framework also helps to identify the interactions and contributions of key actors during the adoption and post adoption process.

## **5. FUTURE WORK**

This framework will be further revised and enhanced during the second stage of the study. For example, different types of actors involved in the process will be further identified and all types of human actors will be interviewed. The actors' roles and critical factors at each stage will be further established. All the empirical evidence required for validating the framework and critical factors will be collected through in-depth semi-structured interviews.

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