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User development through proactive knowledge transfer

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Abstract

Purpose – The purpose of this paper is to elucidate the concept of user development which consists of proactively transferring knowledge to potential users of IT innovations in order to increase the likelihood of innovation adoption and diffusion.

Design/methodology/approach – An exploratory approach was adopted using three case organizations representing different sectors. These organizations represent the public, the semi-government, and the private sectors.

Findings – The findings show that proactive knowledge transfer builds the requisite absorptive capacity of users to understand, adopt new and complex systems and technologies, and effectively integrate them into their organizations, hence increasing their likelihood of adopting such innovations. The findings also show that effective user development hinges on proper selection of potential users and on goals alignment between the innovating firm and the selected users.

Research limitations/implications – The framework could be further refined through more diverse case studies from a broader range of companies. Survey-based investigations are also needed to operationalize the constructs and explore its effects on the performance of the innovating firm. In practice, innovation managers should be more proactive by recognizing the value of knowledge transfer when it comes to expanding and accelerating the adoption and diffusion of their innovations.

Originality/value – This paper illustrates the importance of proactive knowledge transfer, especially in situation that call for absorptive capacity building. This paper also opens new opportunities for innovation managers to sell their innovations faster and to a wider market, and perhaps even altering the trajectory of particular innovations.

Keywords Innovation, Absorptive capacity, Knowledge transfer, IT adoption, User development

Paper type Research paper

1. Introduction

The advent of the knowledge-based view of the firm (Grant, 1992) has enriched our understanding of how firms compete. Innovation in the broader sense includes technological as well as management innovations (e.g. see Hargrave and Van de Ven, 2006; Birkinshaw *et al.*, 2008; Ruiz-Jiménez and Fuentes-Fuentes, 2013) such as new techniques, processes, strategies, structures, and practices. Academia and industry have benefited significantly from knowledge management (KM) related theories, practices, and their cross-linkages with other fields such as marketing (Song *et al.*, 2009; Lehtimaki *et al.*, 2009; Jennifer, 2004) and supply chain management (Malhotra *et al.*, 2005; Garcia-Murillo and Annabi, 2002; Hult, *et al.*, 2006). The research interest in the value of knowledge in innovation (Pennings and Harianto, 1992; Quintane *et al.*, 2011; Reardon and Davidson, 2007) has been increasing. Undeniably, knowledge that provides the firm with the ability to innovate (e.g. see Lin *et al.*, 2012) and adopt various types of innovations (e.g. see Chong *et al.*, 2014), has taken center stage as a sustainable source of competitive advantage.

The decision to adopt new technologies and innovations can be motivated by a myriad of factors, such as the attributes of the innovation that can act as drivers or

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obstacles to adoption and diffusion (e.g. see Davis, 1989; Belanger and Carter, 2008; Eze *et al.*, 2014; Venkatesh *et al.*, 2003; Plewa *et al.*, 2012). User's understanding of potential benefits was found to be an important motivator for innovation adoption (Frohlich, 2002). Extant research showed that anticipated benefits have a medium to strong effect on Electronic Data Interchange (Narayanan *et al.*, 2009), Enterprise Application Integration (Kamal and AlSudairi, 2009), E-Government Adoption (Weerakkody *et al.*, 2012), and Open Source software (Marsan *et al.*, 2012). Yet, the complexity or perceived difficulty of use can prolong the adoption process or inhibit it altogether, as the implementation of a new technology might require learning both at the individual and the organizational levels (Attewell, 1992; Pérez-López and Alegre, 2012; Marsan *et al.*, 2012; Messerschmidt and Hinz, 2013). This perspective on innovation adoption invokes the notion of absorptive capacity (Cohen and Levinthal, 1990).

Absorptive capacity, defined as the ability of a firm to recognize the value of new external knowledge, to assimilate it, and to apply it to commercial ends, has been shown to be a promising component in enhancing innovation adoption and the firm's ability to effectively implement it (Boynton *et al.*, 1994). Possession of related expertise permits the organization to understand and evaluate new innovations as to their eventual use (CacciaBava *et al.*, 2006). As users become more aware of the vendor's product as well as how and when it should be used, they are more likely to demand the product. This is predicated on the premise that, as the absorptive capacity of the recipient firm increases, it is more likely to absorb new knowledge and apply it toward innovative products and services (Chen and Ching, 2004).

Nevertheless, this paper acknowledges that adoption decisions depend on other factors such as the new system's technical compatibility, availability of technical and professional staff, managerial competencies, size of the organization, as well as financial support. Prior research that studied technology and innovation adoption focused on intention and willingness to use (e.g. Alomari, Woods and Sandhu, 2012; Belanger and Carter, 2008; Carter and Belanger, 2005; Chang *et al.*, 2005). Several of these studies were based on the Technology Adoption Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology model (Venkatesh *et al.*, 2003).

The role of IT innovation continues to evolve as it provides organizations with opportunities to reduce cost and increase revenues (Luftman *et al.*, 2013). For example, IT innovation and diffusion in the business to government context are primarily reflected in E-Government where it is being used with two central aims – improve public services, and provide value for money (Esteves and Joseph, 2008). Our study focuses on innovating organizations seeking to expand and accelerate the adoption and diffusion of IT innovations, especially to non-lead users. Consequently, we reasoned that proactive knowledge transfer would help build the requisite absorptive capacity of users to understand and adopt new and complex systems and technologies, hence increasing their likelihood of adopting such innovations. In this paper, proactive knowledge transfer is distinguished from reactive knowledge transfer based on the timing of the transfer. We consider knowledge transfer performed by the vendor or innovating organization during or after the adoption of the innovation, as a reactive one since it is a response to the expressed needs of the user. In contrast, proactive knowledge transfer is undertaken before the adoption is made by the user. This, of course, does not preclude future knowledge transfer initiatives throughout the adoption process. Hence, in user

development the innovating or vendor organization initiates the knowledge transfer before any expressed need from the potential user; and before an adoption decision is made by that potential user regarding a particular innovation. It is also important to note that potential users of a given innovation could also be the vendor's current customers. That is, they could themselves be current users of the vendor's other available products and services.

However, developing user specific knowledge transfer strategies can often be a tiresome and expensive undertaking. Therefore, it is important to differentiate among users to identify the most promising and profitable ones. Based on the principle that not all users are created equal, Knox (1998) suggested that the aim of the customer development process is to build relationships with preferred users who favor the organization's products and services. He added that the customer development process should differentiate between high share customers and low share ones (Knox, 1998). Natti *et al.* (2006) took the discussion even further and proposed the building of Key Account Management systems to ensure that the largest or most important users are given priority. Moreover, misaligning KM strategies with KM processes was found to be a source of failure in KM initiatives. Hence, in the context of proactive knowledge transfer, aligning the goals and objectives of this process between the source and the recipient of knowledge (i.e. innovator and potential user) could be important for a successful user development initiative.

Following this, we embarked on an exploratory study to gain an initial understanding of the process that firms go through and the decisions underlying that process. Figure 1 shows the user development framework that aims at increasing the absorptive capacity of the selected potential users and, subsequently, accelerating innovation adoption and diffusion. Case studies are used as the main research method. Related literature is brought in whenever necessary, for example, when the findings are being discussed, and avenues for future research are outlined. More specifically, we set out to explore the following questions: How do innovating organizations select which users to develop? How do these firms go about developing such users?, and Why should innovating firms plan for knowledge transfer in a proactive fashion?

The remainder of this paper is organized as follows. We begin with a review of the literature on innovation adoption and diffusion, absorptive capacity, and user KM with an emphasis on knowledge transfer. Thereafter, a detailed discussion of research methodology and description of the three case studies of public, private, and semi-government sectors in the United Arab Emirates (UAE) is presented. Subsequently, we conduct a cross-case analysis and outline the process that a firm should follow to undertake a user development initiative. Finally, we conclude with insights for managers and policy makers; as well as implications for further research.

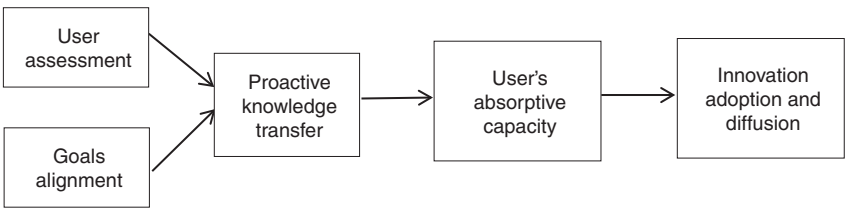

Figure 1.
The user development framework

2. Theoretical background

User development, or end-user development, is a concept that has often been used in the software development field (McGill, 2004; Wallach and Scholz, 2012) with an aim to give users the tools they need to implement their own software. In this paper, we conceptualize user development as a knowledge transfer process that aims at augmenting the recipient's absorptive capacity (Zahra and George, 2002). Our conception of user development is quite distinct from user training, which takes place generally as part of the after sale service (i.e. post-adoption).

Research on the user development process has been primarily addressed in the software development and industrial marketing areas. In software development, the focus has been on the design process (Kautz, 2011), the end-user (McGill, 2004), and the domain expert development (Lepouras *et al.*, 2007). Kautz (2011) found that user participation in the design process provided a balance between flexibility and project progress, hence resulting in a successful software development project. McGill (2004) emphasized the significance of the end user involvement in application development. Meanwhile, Lepouras *et al.* (2007) demonstrated the important role that domain experts played in the development of e-government services.

We, therefore, consider user development as a relatively underexplored process that consists of transfer of knowledge from the vendor to the potential user. Research in industrial marketing mainly focused on business-to-business (B2B) marketing (Knox, 1998; Peppers and Rogers, 2001) as well as project marketing (Athaide *et al.*, 1996; Lepouras *et al.*, 2007). Knox (1998) explained how customer development is related to loyalty management and found that when loyalty is increased, customers are more accepting of development.

Meanwhile, Peppers and Rogers (2001) considered customer development as an ongoing change in the way firms manage their relationship with other firms. Yet, none have emphasized the importance of KM, in general, and knowledge transfer, in particular, in the customer development process. Therefore, we identified a research gap when it comes to viewing the knowledge transfer process and its relevance to user development in the management and selling of complex technological innovations. Furthermore, such body of literature did not consider knowledge transfer as a strategy towards increasing the user's absorptive capacity.

2.1 User's knowledge and knowledge transfer

The notions and importance of customers and users are not new in the Information Technology/Information Systems Management field. They have been discussed quite extensively in the literature before (e.g. Friedman and Cornford, 1989). Customers are often referred to as the ones that purchased and pay for the product. Customers might also be users who are using the product. As goods and services become more sophisticated and complex, it is often necessary for potential users to learn enough about the new products, services, and other knowledge intensive offerings before making a purchasing decision. In order for an innovative firm to be able to augment the knowledge of its existing and potential users, it has to develop ways to effectively and efficiently transfer knowledge to them.

Knowledge transfer is a process through which the receiver is affected by the experience of the source (Volkoff *et al.*, 2004; Argote and Ingram, 2000; Szulanski, 1996). During knowledge transfer, knowledge residing in the supplier (source) is conveyed to the user (receiver) through various methods such as direct personal interaction,

information systems, and networks. In addition, the transfer process can either be formal or informal. Formal transfer involves structured procedures and steps for sharing knowledge while informal transfer happens in an unstructured and spontaneous manner. However, the fact that the transfer takes place does not necessarily imply that the knowledge status of the receiver has been augmented. For instance, if one attends a seminar or a lecture, it does not necessarily mean that he or she has successfully absorbed all of the knowledge being presented. Furthermore, the receiver's failure to achieve the desired standard of "knowing" can also be considered as a failure of the knowledge transfer process. This part was explained by Davenport and Prusak (2002) as they asserted that knowledge transfer requires not only transmission of knowledge, but also absorption and usage. Meanwhile, Lane *et al.* (2001) recognized this aspect and proposed that the abilities to understand and assimilate knowledge are distinct from the ability to apply knowledge. These are knowledge transfer issues that firms must deal with in order to successfully develop the knowledge of their users and consequently create new and more profitable users.

Increasingly, for the purpose of developing their users, companies are adopting extensive Customer Knowledge Management (CKM) practices (Chua and Banerjee, 2013; Garcia-Murillo and Annabi, 2002) that deal with knowledge for, from and about the users (Dous *et al.*, 2005; Su *et al.*, 2006). More recently, (Lehtimaki *et al.*, 2009) illustrated the value and role of KM tools, principles, and activities in the process of selling complex technical solutions to corporate users in an industrial setting. Our study builds on the aforementioned interdisciplinary research and focuses only on the for user aspect of CKM.

2.2 Absorptive capacity

This paper argues that absorptive capacity is a key factor that qualifies a firm's predisposition to adopt and successfully implement an innovation. The focus here is on one of several internal factors that affect an organization's ability to acquire and utilize new knowledge and to adopt and implement an innovation. Absorptive capacity can be defined as "a firm's ability to assimilate external knowledge, develop and refine the routines that facilitate combining existing knowledge with the newly acquired and assimilated knowledge" (Messerschmidt and Hinz, 2013). It is also defined as the "capacity to learn and the ability to identify, assimilate, and exploit new knowledge" (Daghfous, 2004). Lane and Lubatkin (1998) proposed the concept of relative absorptive capacity. They suggested that absorptive capacity can be viewed as a dyad-level construct (looking at two firms) rather than a single firm level construct. As user development takes place between two independent organizations, the concept of relative absorptive capacity becomes more important to interorganizational learning than the commonly used measure of absolute absorptive capacity. Since knowledge transfer is usually a give and take process, it becomes quite insightful to look at the absorptive capacity of both firms taking part in the transfer. A more recent study done by Tseng *et al.* (2011) advanced the concept of absorptive capacity by defining it as the interaction among three main sources of knowledge, namely knowledge input, knowledge spillover and knowledge absorptive capacity.

It is also important to note that absorptive capacity has become an essential component in understanding innovation management practices and innovation adoption (Boynton *et al.*, 1994; Diaz-Diaz and Saa-Perez, 2014). The availability of the requisite prior related knowledge within the receivers' firm allows for a better

acceptance and retention of the value of the new products and services being offered (Harrington and Guimaraes, 2005; Cohen and Levinthal, 1990). With less capable firms, the focus should be more on the capability creation aspect (i.e. absorptive capacity augmentation) while with users that are already more capable, the focus should be on the improvement of the implementation aspect (Bessant *et al.*, 2003).

2.3 Innovation adoption and diffusion

There are numerous theoretical and empirical studies on the subject of innovation diffusion, adoption, and successful assimilation. For instance, the literature on IT Innovation is replete with studies of critical success factors for Enterprise Resource Planning adoption and implementation (e.g. Park, Suh, and Yang, 2007; Altuwaijri and Khorsheed, 2012). These studies focused primarily on the post-adoption phases, which include implementation, adaptation, and acceptance; and provided ample evidence of the role of users' training, education and learning in the success of such projects.

Meanwhile, studies related to the pre-adoption phase found that several internal factors influence the firm's readiness for innovation adoption and, subsequently, the adoption decision (Premkumar and Ramamurthy, 1995; Teo *et al.*, 2003; Iacovou *et al.*, 1995; Taherparvar *et al.*, 2014). These factors relate to the managerial, technological, and organizational resources possessed by the recipient firm, including organizational readiness for innovation adoption (Bellantuono *et al.*, 2013; Ruiz-Jiménez and Fuentes-Fuentes, 2013). Often times, government institutions have either delayed the adoption of innovative programs (Sprecher, 2000) or rushed to adopt innovative programs, resulting in poor quality program adoption (Damanpour and Scheider, 2009; Franzel, 2008; Kwon *et al.*, 2009; Weerakkody *et al.*, 2012).

Davis (1989) developed the TAM, which seeks to explain why individuals choose to adopt or not adopt a particular technology when performing a task. According to TAM, perceived usefulness and perceived ease of use (Davis, 1989; Gefen and Straub, 2000) are causally linked to attitudes, intentions, and actual use. Information systems researchers have expanded and adapted TAM (e.g. Mathieson, 1991; Segars and Grover, 1993; Szajna, 1996) including several studies about how TAM can be used to examine the adoption of online systems (e.g. Featherman and Pavlou, 2003; Gefen and Straub, 2000).

Rogers (1995) defined innovation diffusion as the process by which it is spread among people linked together through social networks. He also referred to innovation adoption as "the decision of any individual or organization to make use of an innovation" and differentiates it from diffusion. Rogers' diffusion of innovation (DOI) theory has been widely used by Information Systems researchers to explain users' behavior in the adoption of innovation. Sykes *et al.* (2009) added to the rich literature on individual adoption and use of innovations by using a social network perspective to add insights into the dynamics of new system adoption. Innovation adoption and acceptance influence the success of innovation diffusion. Therefore, it is very important for the innovating organization to find ways to make their target users aware of the usefulness of the innovation. Many innovative products fail because users did not realize their importance or usefulness (Alomari *et al.*, 2012), did not trust them (Miltgen *et al.*, 2013), did not like the complexity or design of the products (Alomari *et al.*, 2012), or did not see how these products are superior compared to other alternatives (Frambach and Schillewaert, 2002).

There are three aspects of an organization's context that can affect its decision to adopt a technological innovation (Soares-Aguiar and Palma-Dos-Reis, 2008). These three aspects are:

(1) organizational structure such as organizational size, complexity of management structures, and formalization;

(2) technological context which describes the current technology used in the organization and technologies used in other organizations; and

(3) environmental context such as type of business, competitors, and suppliers.

For example, in order for an organization to accept new technological innovation it must decide whether it would be useful and compatible with the company's structure, whether the employees would be comfortable with the new system and whether the technological innovation is being widely used by others. In a study of small and medium enterprises in Italy, Corrocher and Fontana (2008) analyzed how specific characteristics of the recipient firm affect its perception of objectives. They also looked at drivers and obstacles to adoption of Local Area Networks technologies. They found that the diffusion of standards and knowledge about a given innovation, which reduces uncertainty, proved to be a more successful strategy to foster adoption than the mere provision of generic public funds or other types of incentives for SMEs.

3. Methodology

In this exploratory investigation, three case studies were cross-analyzed to investigate the user development process. Case study research can be used in a single or multiple cases, quantitative and qualitative data, and multiple research paradigms (Yin, 2009). Thus, case study research can contribute in a holistic way to all phases of theory development (Eisenhardt, 1989). Since cases reflect real life situations, they should represent successes as well as failures. Therefore, we chose three different types of organizations in the public, the semi-government and the private sectors that have experienced various successes and failures in new technology adoption and diffusion. In addition, we focused on the UAE, a unique country that has features of both developing and developed countries. The UAE has a population of approximately 9.35 million people (est. 2014), with a strong traditional culture like many developing countries but at the same time it is considered as a high income economy with an urbanized population (*World Fact Book*, 2014). It has a per capita GDP of $29,200 (est. 2012), ranking 49, in par with leading Western nations (*World Fact Book*, 2014). By studying these three organizations from different industries that are located in the UAE, the results obtained would be relevant to a wider array of organizations compared to studies that focused on a single industry or studies conducted in either developed or developing countries.

We contacted five organizations in each of the public and semi-government sectors, and ten companies in the private sectors in the UAE. Only two of the public, two of the semi-government, and three of the private organizations agreed to participate in the study. We asked these seven organizations about knowledge transfer practices related to user development, and the processes of enhancing adoption and diffusion of their IT innovations. After the final screening, one organization from each of the three sectors was maintained because of their likelihood to offer unique insights into our understanding of user development, knowledge transfer, and IT innovation adoption and diffusion issues. Table I describes the three organizations selected for this study.

Case organization	Sector	Background	Key informant
EGov	Government	Initiated in 2001 The first e-Government program in the Middle East region The initiative transformed more than 1,600 governmental services to an electronic platform and is being used by more than 45 government entities in the UAE	eServices Director eServices Provisioning Officer
EBiz	Semi-government	Founded in 2000 The first business-to-business online market place in the Middle East region Won many awards including Best e-Content Provider in e-business for the World Summit for Information Society	Account Manager General Manager
NetCo	Private	A local company that was established in the UAE in 2001 One of the largest telecommunications, safety and security systems integrator operating in the Middle East, Africa and Asia Pacific (in 2013) 2,000 full time employees	Vice President of Marketing IT Director

Table I.
Basic description of the case organizations

The first organization is a public organization in the UAE (EGov). EGov was in the initial stages of e-government implementation and diffusion. This e-government case is useful for our study because it represents the introduction of a significant IT innovation as well as government reinvention. Governments are realizing that IT Innovation such as those related to e-business revolution could help them achieve a similar transformation. This realization resulted in the emergence of e-Government (Layne and Lee, 2001), which can be defined as a way for governments to use the most innovative Information and Communication Technologies (ICT), namely web-based internet applications to improve services provided to the citizens and businesses (McClure, 2000). E-government also helps to bring citizens and businesses closer to their governments.

The second organization (EBiz) was a semi-government B2B marketplace in the UAE. EBiz provided innovative online services such as product comparison and procurement. In addition, EBiz also provided a portal for suppliers to advertise and sell their products online. EBiz was selected for this study because it had created and maintained the highest standard of B2B user service and trading facilities in the Middle East region. It was the sole online procurement service provider with a demonstrated knowledge of unique challenges and traditions of the region's business community.

The third organization was a telecommunications contractor and systems integrator (NetCo) serving users in the fields of ICT, oil and gas and power networks in the UAE. The firm mainly designed systems based on requirements, procured the required material from international companies and performed the integration locally, after which it was installed for the users and continuously maintained. We chose this particular firm because it was one of the largest telecommunication contractor and systems integrator in the Middle East. In addition, NetCo operates in a highly

competitive industry; and ICT innovation was a critical component of the firm's business strategy.

3.1 Data collection

Data for the case studies was obtained mostly by personal, in depth and onsite interviews, followed by e-mail and telephone conversations with the top management team of each organization including the Directors, Executive Managers and their immediate subordinates (see Table I for detail of the key informants). Data collection occurred over a period of three years from 2005 to 2008. We selected top level management since we believed they were knowledgeable about their organization's KM as well as CRM policies and practices. In addition, our key informants were directly involved in making strategic decisions for the organizations. Therefore, the likelihood of collecting reliable and useful data would be higher. The purpose of our interview questions was to get a better idea of the approaches and steps undertaken by the companies in developing their users. As such, the research instrument focused on the following discussion themes:

- overview of the interviewee's organization;
- overview of the innovative IT products and services in question;
- the timing and rationale for the organization to embark on a knowledge transfer initiative with particular users;
- the rationale and process used to select particular users for development; and
- how the knowledge transfer process/project was carried out.

We chose face-to-face interviews because they provide a greater degree of social interaction with the interviewees (Easterby-Smith *et al.*, 1991). The interviews were more of a discussion between both sides; and they lasted between one to two hours. The interview questions revolved around the rationale, obstacles, benefits, and methods used by the case organizations to expand and accelerate innovation adoption through knowledge transfer.

In order to control the quality of the information, all participants were promised anonymity and confidentiality of their responses. Each interview was either tape recorded or recorded on paper for transcription and analysis. All communications that were done through e-mail were saved and all telephone conversations were recorded as well. We also adopted multiple sources and methods of data collection in order to improve the evaluation of our findings and achieve a better understanding of the study (Merriam, 1988). In order to address the concerns regarding validity and reliability in our research process, we took the following steps at every phase of our research. In terms of construct validity, we performed in-depth interviews using multiple interviewers and allowed the interviewees to review related case study transcript upon the data collection phase. Internal validity was ensured by using not only formal but also informal conversations, multiple informants for the interview, document analysis provided by the participants list in Table I, and the proper recording of data. Moreover, we used semi-structured interviews and conducted thorough discussions among ourselves in order to increase internal validity during data analysis phase.

In order to increase external validity, we designed a clear outline of the case studies that could be readily replicated (Jick, 1983). Finally, to increase the reliability of our study and validate our data for better integration of the theories, we used a proper case

study protocol, shared questionnaires with all the interviewers, and had both authors check the interview transcripts. By using different sources of data described above, we were able to triangulate the findings (Yin, 2009).

3.2 Data analysis

In this study, we used the staged approach for data analysis because it allows investigators to gain a deeper understanding of the collected data (Easterby-Smith *et al.*, 1991). In the preliminary stage, we prepared a full transcript of the interview data that we collected from face-to-face interviews and checked them against the interview notes. We also prepared follow up notes based on document analysis and data that we collected from telephone and e-mail interviews. The preliminary stage helped us gain a substantial familiarity with the data and we were able to fill the gaps in the transcripts where the recording was unclear. Once the preliminary analyses had been developed, we read through and summarized the edited transcripts question by question manually. For each question, we carefully studied the transcripts and made detailed notes from the interviewees' point of views. We, then, condensed our notes into brief summaries of each interview allowing us to cluster them accordingly. In the final stage, we compared our results to the theoretical insights and prior findings in the literature to building theory from case studies (Eisenhardt, 1989).

4. Findings

4.1 Prerequisites of user development

4.1.1 User assessment. EGov found its user development initiatives to be very challenging due to the knowledge intensity and complexity of the new system and the significantly less knowledgeable users. Indeed, the new IT systems offered by EGov were considered new to the users, complex, and knowledge intensive as in innovations occurring in various other IT industries. Moreover, the knowledge seller and potential users here did not belong to the same governmental organization, although all of them belonged to the same government. The recipient organizations, in this case, were essentially government departments, ministries, and agencies that were independent from EGov. Hence, these user organizations can be considered as external users. Although EGov did not develop the new egovernment application platform, it was assigned to introduce it to other organizations in the same government. Also, our data showed no indication that these recipient organizations were obligated to adopt the new technology through a governmental mandate. Rather, they were being converted through knowledge transfer. Hence, the context of this case indicates the broad applicability of our findings across IT industries and innovations aimed at potential external users.

EBiz informants asserted that their continuous success was partially attributed to the coordination and constant development process that took place between the organization and its users. The organization put a very high emphasis on the users as reflected in its mission statement. As explained by the general manager, "it is very important for the organization to develop strong relationships with the users because they are the most effective marketing tool that can help increase the demand on their services and increase their knowledge and innovation." He also added "the barrier to entry is very high in the B2B industry because it is very expensive to develop and maintain the users." As such, EBiz was self-described as "very careful" when choosing its key users. The development process at EBiz started with the selection of the key

users to be developed. The selection was based on total number of bids, overall percentage of purchases done, percentage of purchases relative to other similar companies and the companies' estimated future growth. According to the account manager, "the criteria were carefully selected to maximize potential benefit to the company."

The third case organization, NetCo, operated in a highly dynamic industry with an intense level of price competition and speed of technological change. The firm mainly designed systems based on requirements, procured the required material from international companies and performed the integration locally, after which it was installed for the users and continuously maintained. Its products and services included optical transmission, microwave transmission, access delivery (xDSL, Ethernet, Triple Play), and VoIP solutions to both public telecommunications and private network users. The products and services provided were knowledge intensive. Even though NetCo had no formal user development procedure, it encouraged and required constant learning from its employees. According to the VP of Marketing, "We have to make sure that our employees are highly qualified in order to effectively communicate with our customers." As such, NetCo was very careful when selecting the right employees to attend to their customers. Table II summarizes the related findings from the cases.

4.1.2 Goals alignment. The EGov case illustrates the importance of having a mutual understanding between the users and a formally established user development (UD) team. For EGov, once the promising users were chosen, a team from EGov and a team from the agency (knowledge recipient) met to clarify the objective of the development process. An external auditing committee usually monitored those meetings. The recipient governmental agency's goals were typically related to

Case organization	Testimonies of key informants	Formal/informal user assessment
EGov	"In order to truly develop, we need people from different departments and organizations to be the driving force behind the wheel of innovation" (e-Services Director) "It is not easy to transform governmental services to an electronic platform without the support of our people (employees and users)" (e-Services Provisioning Officer)	Formal guidelines for user assessment
EBiz	"Because it is expensive to develop and maintain users, we are very selective in choosing our employees for user development" (Account Manager) "We select only the best employees for each project" (General Manager)	Formal guidelines for user assessment
NetCo	"Our employees are always engaged in learning activities such as going to exhibitions, researching on the products, and attending seminars so we do not have any issue selecting any of them for any project" (VP of Marketing) "Although we do not have a formal guidelines and dedicated task force on user development, each task or projects we execute require some level of evaluation" (Director of Sales)	No formal "user assessment" guideline in placed. User selections were made based on supervisors' recommendations

Table II.
User assessment

enhancing their users' competency that allowed for more innovation adoptions leading to more successful implementations and increased performance. They asserted that by developing the various governmental agencies, EGov created more potential for future IT innovation adoptions and successful implementations. It had a strong belief that the more an individual knows, the more knowledge she demands. In order to measure the effectiveness of the development process, both sides needed to set the standards and performance measures for each process. However, they were tightly monitored and modified, when required, by the external auditing committee.

The performance measures ranged from simple exam grades, for the e-Learning initiative, to complex project portfolios to re-engineer agencies and increase employee productivity. Even the external auditing committee enhanced its skills in determining the performance measures for future projects through the recursive cycle of developing different performance measures. The governmental agencies' needs were usually related to enhancing employees' competency, which allowed for more innovation, creativity, business transactions and subsequently profits. On the other hand, EGov believed that the more an individual knows, the more he or she required knowledge which would eventually create potential future IT adoption.

The EBiz interviewees indicated that, once the key users were determined, they were grouped based on their industry and assigned a group of consultants to each of them. If no in-house expertise existed in a specific area, EBiz would hire external consultants to work with its employees to the assigned company. According to the general manager, "EBiz always looks for a win-win situation during the development process but sometimes we do face resistance from the users […] when faced with such situations, we usually reassess the user and weigh the benefits against the costs of the development including the cost of changing the company's perspective of the entire development process." During the development process, EBiz also developed performance measures using both qualitative and quantitative measures depending on the company itself. It is equally important to note that EBiz informants insisted that they worked very closely with users to develop performance measures in order to achieve the same goals.

As shown in Table II, NetCo did not have any formal procedure for user assessment. Interviewees justified this by the fact that NetCo had a handful of clients; and that allowed them to better focus their attention and resources on strengthening the relationships with those clients. Even though NetCo felt that it had a good understanding of its users' needs and requirements, it continuously engaged in informal interaction such as outings and casual phone conversations. NetCo also made sure that both parties agreed on the objectives of a particular knowledge transfer project. This aimed at preventing conflicts and misunderstandings. Additionally, NetCo believed that having a clear understanding of what the users needed helped increase market share, better forecast new opportunities, reach new users, and get more referrals. Both key informants insisted that, "users with strong relations also listen and were considered more receptive to any knowledge being transferred." Consequently, NetCo felt that it was very important to really understand customers' needs and to make sure that both sides are on the same page.

4.2 Proactive knowledge transfer

EGov developed an eLearning portal that offered its users more than three thousand courses, where governmental agencies could choose among international certificates, or

customized packages that would serve its specific needs. As stated by the eServices director, "In order to truly develop, we need the different governmental departments, organizations and employees to be the driving force behind the wheel of progress. Therefore, we have to do whatever it takes to make sure they have the necessary knowledge."

Depending on the nature and objective of the development process, EBiz decided on the method that would be the most suitable to measure the current knowledge of the users. Finding the right method was very important for EBiz to evaluate and measure the effectiveness of the development process. In order to evaluate the current level of user's knowledge, EBiz typically reviewed the company's documentations and relied on face-to-face interviews with the users. EBiz would, subsequently, hold workshops, seminars and tutorials for the users for the purpose of sharing knowledge. Once the process was over, an auditing team from EBiz made sure that the project requirements were successfully met.

The audit team submitted a detailed project assessment report to the management including the performance of the development team. This evaluation affected follow-up decisions regarding the user development initiative. In addition, the audit team evaluated the performance of the third party consultant when applicable. EBiz understood that the third party consultants, in some cases, were not willing to share all the knowledge because they wanted to maintain their monopoly in the field. In order to maximize the benefits to the knowledge recipients (i.e. potential users), EBiz had to develop close partnerships with such third party knowledge providers. Moreover, EBiz believed that the transfer of explicit knowledge was sufficient to increase the absorptive capacity of its users. This somewhat contradicts the viewpoint of prior research, where tacit knowledge was found to be more influential in developing users than explicit knowledge (Natti *et al.*, 2006); and to be more effective in sharing organizational knowledge (Ho, 2009; Montazemi *et al.*, 2012).

In contrast, NetCo communicated quite frequently with its users, almost on a daily basis. This was made easier because it only had "a handful" of them. The organization communicated with its users mainly using e-mail, in addition to phone calls and face-to-face meetings. The type of knowledge transferred to the user varied from product specific to important but broader changes in the technology and the industry, including new developments in products and services. This kind of explicit knowledge was easily transferred through e-mail or NetCo's web site. Meanwhile, when the firm needed to demonstrate or clarify the technical use of a product, "showing" the users was considered the best way to transfer tacit knowledge. Interestingly, the marketing manager noted, "there's a cost for the knowledge that is shared therefore we have to be very selective in both the types of knowledge to be transferred and the recipient as well." As such, the company developed various levels of knowledge transfer such as those related to troubleshooting the system, operating the system, and maintaining the system.

When communicating with its users, NetCo made sure it used the same technical language. This was done by clarifying the exact meaning of the terminology being used and making sure that both parties were "on the same page." NetCo has no formal CRM system or formal relationship protocols but it continuously engaged in informal interaction such as outings and casual phone conversations. NetCo also provided training, supported users in projects, and maintained their systems. Most of this was done during and after sales (i.e. reactive knowledge transfer). Presales activities included giving product presentation, conducting seminars, and participating in exhibitions (i.e. proactive knowledge transfer).

4.3 Users' absorptive capacity

From our analysis of the three case companies, we found that they undertook a number of initiatives to help them increase the absorptive capacity of their users. For example, EGov believed that it was very important to engage in activities that could increase the absorptive capacity of its users. EGov reasoned that these activities would eventually increase its users' ability to accept and incorporate new knowledge. EBiz on the other hand divided its users into knowledgeable and less knowledgeable. For the less knowledgeable users, they focused more on the capability creation aspect, while with the more knowledgeable users they focused more on the improvement aspect. EBiz had a dedicated team of experts to help with both groups of users. NetCo continuously gave presentations, conducted workshop and held seminars for the less knowledgeable users. NetCo realized that knowledgeable users were easier to communicate with and their high knowledge often resulted in innovative product developments. According to NetCo's eServices director, "When the users have a full understanding of the products or services that we provided to them, they will be more satisfied with the products or services and this often lead to higher adoption of products and services."

5. Discussion

The findings from the case studies reveal valuable insights into how managers could proceed with user development. Specifically we were able to answer our initial questions:

(1) Why should innovating firms plan for knowledge transfer in a proactive fashion?

(2) How do innovating organizations select which users to develop?

(3) How do these firms go about developing such users?

How do innovating organizations select which users to develop?

From the case studies we can surmise that selecting all potential users and developing them would not be a sound strategy. Moreover, all three case organizations were aware of the importance of having knowledgeable employees to conduct the user development initiative; but not all of them have a formal procedure for the selection process. Prior research has mainly focused on the importance of having supplier assessment in order to increase new product development projects (Zolghadri *et al.*, 2012) and supply chain agility (Ngai *et al.*, 2011). No studies were found in the literature concerning user development. However, based on the three case studies that we performed, selecting the right users for the development process seemed to be crucial.

Hence, organizations should identify and assess users before embarking on the user development process. At this point, the innovating firm should focus only on the most promising users that are expected to be highly profitable. In addition, assessing the degree of familiarity of the innovating firm with each potential user is essential. Any prior involvement or interaction with a given potential user may provide useful information and, hence, should not be overlooked. Here, knowledge enabled user relationship management systems would be very helpful as a handy repository. Yet, users that are found or expected to have a very low absorptive capacity and would require extensive resources (i.e. with a relatively high expected cost/benefit ratio) should not be selected or developed.

How do these firms go about developing such users?

The findings also showed that it was very important for all three case organizations to collect knowledge from users through various means such as business portals,

event sign ups, and direct interaction with the users. The transferred knowledge covered current products and services, future product preferences, and various other kinds of feedback. Both users and the UD team should also develop performance measures and standards that can be used to evaluate the process outcomes. These standards are to be derived from the goals and objectives that have been defined. Potential users may have different goals. Thus, it is essential to note that these measures are in direct relation to the objectives outlined previously. Both sides should also develop and agree on a systematic continuous evaluation scheme, depending on the number and type of milestones established throughout the user development initiative.

Developing users in areas deemed unnecessary would be costly and even counterproductive (Ngai *et al.*, 2011). As a result, the UD team, along with representatives from potential users, should meet to discuss and share information that would lead to the alignment of their needs because it can positively affect the user development process (Hadaya and Cassivi, 2012). It would be detrimental to the entire user development initiative if the goal is to attempt to increase all aspects of the user's absorptive capacity. In such a case, the process would be too long, costly, ineffective, and ultimately futile. Therefore, the UD team from the innovating firm should carefully match both sets of needs for this stage in order to be successful. Still, contractual agreements are needed since revealing too much about the new technology might enable potential users to apply it on their own. Additionally, the UD team should mitigate the risk that potential users might share the acquired knowledge with the innovating firm's competitors. It is also important for the innovating companies to share with users knowledge about the current state, IT solutions' benefits, and future directions through various media such as face-to-face communications, documentations, information portals, workshops, seminars and specialized training.

Why should innovating firms plan for knowledge transfer in a proactive fashion?

Our findings suggest that the more effective the knowledge transfer is, the higher the absorptive capacity of the users. For example, EBiz kept the collected data about its products, services, and even users in data warehouses. EBiz used business intelligence algorithms to analyze and discover trends and patterns that could support decision-making, product optimization and useful information about its users before they started engaging in any knowledge transfer activities. Based on the case findings, we can infer that regardless of the type of knowledge transferred, absorptive capacity can be increased if the knowledge transfer process is handled properly.

Prior research has shown that absorptive capacity helps increase users' satisfaction that leads to higher adoption of products and services (Wagner and Buko, 2005). Our results also indicate that when an organization (e.g. EGov) engaged in activities that increased the absorptive capacity of its potential users, it also increased the ability of the users to accept and incorporate innovation into their internal operations. User development begins with a focus on the importance of selecting the right users for user development. There are many methods that companies could follow in order to develop users at this stage. EGov, for example, created a "community of practice" or a consortium, provided in-house workshops and seminars, and encouraged weekly meetings. This was essential for EGov because without a consortium, it may have been difficult to bring together suppliers, users, and related parties to participate in similar projects.

Even though only EGov and EBiz had a formal process for developing users, all three case organizations agreed that the UD team had a big influence on the degree of knowledge transferred within the organization. The UD teams also played an important role in ensuring the success of knowledge transfer initiative to and from the users. Therefore, it is crucial to select promising users with the right knowledge and understanding of the innovation in question. The findings also suggest that the UD team's role and the basic knowledge of team members influenced knowledge transfer.

Successful knowledge transfer occurs when the recipient understands and is able to apply the knowledge that she learned (Argote and Ingram, 2000). Through effective user assessment activities such as profiling, innovating firms could generate valuable knowledge about users. This knowledge is considered a prerequisite for the user development process. It tells the source (innovating) firm all about its receiver (user) and what types of mechanisms are needed to better facilitate the knowledge transfer process. Specifically, it helps the source firm determine the objectives of the knowledge transfer, the knowledge that needs to be transferred, the most suitable recipients, and the appropriate knowledge transfer mediums (Chen and McQueen, 2010).

Our results indicate that user assessment and goal alignment guide and precede proactive knowledge transfer which, in turn, augments the user's absorptive capacity. By proactively transferring knowledge that builds the requisite absorptive capacity of potential users to understand, adopt, and integrate new and complex systems and technologies, we can expect that users would gain a more positive view of the innovation, hence progressing faster towards adoption and diffusion. Innovating firms seeking to sell their new complex products and services to potential users, especially to non-lead users, could readily implement this process. In addition, this process could be used by innovation managers seeking wider and faster adoption and DOIs internally within their multinational firms or multiunit organizations.

6. Conclusions

Our endeavor for this study was to expound the concept of user development and gain a deeper understanding of how and why organizations initiate, plan, and undertake this process in the context of IT innovations. While extant literature is replete with studies on the adoption and diffusion of IT innovations, there exists a dearth of research on user development as a proactive process of transferring knowledge to potential users in order to augment their absorptive capacity and increase the likelihood of adoption and accelerate diffusion. In the previous section, we discussed how we addressed the aforementioned research gap; and how we achieved our objective of addressing the three research questions identified in the introduction. This paper contributes to the academic understanding and practical application of user development from the standpoint of the organization supplying the IT innovation. The following section outlines such contributions.

6.1 Research and managerial implications

Our study offered evidence to support our proposed framework by demonstrating how user development, through proactive knowledge transfer, could be applied by innovation managers in IT industries to expand and accelerate the adoption and diffusion of IT innovations. Proactive knowledge transfer, hence, can help the

innovating firm build the requisite capacity of their potential users during the introduction of new technology and innovations. The ultimate objective is to increase the likelihood and speed of adoption. Although previous researchers have studied in details consumers' reaction to new innovation and the antecedents of their perceptions (e.g. see Alomari *et al.*, 2012; Martin and Rice, 2010; Wang and Doong, 2010), few have performed detailed assessments of users' prior knowledge while venturing in the new innovation process. Therefore, this paper also contributed to the growing literature on complex technological innovations and user development.

This paper gives a new perspective to the field of innovation adoption and diffusion. It is based on the notion that users' absorptive capacity is a key resource that qualifies a firm's predisposition to adopt and successfully implement an innovation; and that the availability of the requisite prior related knowledge within the recipient firm allows for a faster adoption and effective realization of the value of complex innovations. More specifically, we recommend that innovating firms carefully select the right users to develop and align their user development goals with those of the selected users. It is important to emphasize here that not all users are equal. Therefore, there are potentially significant benefits from selecting and developing the right users.

Our study suggests further practical managerial insights and reveals some interesting angles for future research. Our intention was to show how consideration of user development can enrich and extend our view of IT innovation adoption and diffusion, open new opportunities for innovation managers to sell their IT innovations faster and to a wider market, and perhaps even alter the trajectory of a given innovation. Our conception of user development goes beyond exogenous learning (Chen and Jinhong, 2005) which is essentially based on mere third party reviews; and beyond seller induced learning (Jing, 2011) which is limited to organizing free product trials, onsite demonstrations, and training seminars. While these initiatives focus on transferring context specific tacit knowledge for particular new products, we suggest that innovation managers develop a broader systematic process that focuses on explicit as well as tacit knowledge transfer. With respect to explicit knowledge transfer, we recommend that innovating firms build potential users' absorptive capacity by going deeper into the knowledge foundation of the innovation to include its underlying scientific knowledge. Since knowledge is cumulative, scientific knowledge gained by potential users would provide an understanding of the underlying fundamental properties of the innovation.

User development seeks to go beyond the know what and the know how to the know why in relation to particular IT innovations (Fleming and Sorenson, 2004). As Nelson (1982) and Helfat (1994) showed, knowledge accumulation can serve as a guide for a more effective search for innovations. This would enable potential users to place the tacit knowledge gained through trials and demonstrations in the appropriate context of scientific knowledge, thereby providing ample opportunities for extrapolations and further learning (Montazemi *et al.*, 2012). Hence, innovation managers could also leverage their downstream market relationships by developing their users in a continuous and systematic fashion, thereby enhancing their returns from already established relationships. Finally, innovation managers should look for ways to share a user's accumulated knowledge across IT products and services with similar use characteristics to reduce acquisition costs and decrease the amount of knowledge needed for adoption.

6.2 Limitations

As with any research, our study has limitations. This study is based on data collected a few years ago and, hence, relates to technologies that are currently considered mature. More studies are needed to explore cutting-edge practices of user development as well as their applicability to more recent IT innovations such as cloud computing, smart government, mobile technologies, and e-supply chain management systems. Recent developments and studies on internet-based inter-organizational systems (e.g. see Lin, 2014) suggest that potential users and adopters of new IT and systems can be found both upstream and downstream the supply chain. For instance, in the case of supplier development initiatives, knowledge transfer is aimed at users in the supplier organization rather than customers. Therefore, future research on user development should consider case organizations and respondents from both sides of the focal firm in order to investigate not only user development's impact on market share and performance at the firm level, but also at the supply chain level.

Though we followed a structured and thorough approach and methodology, our results may only be applicable to the type of organizations studied. Additional empirical research is certainly needed in order to further validate and generalize the findings of this exploratory and theory developing study. Longitudinal studies could offer immense insight into the user development process by characterizing the intricacies of every phase as it progresses over time culminating in successful adoption. However, qualitative studies should also investigate failure cases in order to draw valuable lessons for managers as well as discover potential obstacles to user development. Further empirical investigations are needed to operationalize the constructs and explore its effects on the performance of the innovating firm. Future survey research should also explore how the outcome of the user development process or initiative may vary depending on factors such as the industry of the innovating firm, the knowledge intensity of the product, and the absorptive capacity of the target user.

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