

Empowering Capability for Innovation in IT Organizations

A Confluence of Knowledge for Continual Organizational Learning

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Abstract: In IT based business model innovations, emerging technologies introduce disruption into processes and organizational capabilities that could be difficult to overcome. IT services organizations must maintain their IT capabilities of innovation integration in order to exploit it internally and for their customers. Using the literature on resource based views as a grounding for organizational capabilities, this paper introduces a model of continual organizational learning that empowers IT organizations for innovation integration. Through in-depth case studies conducted at IT services companies, this exploratory research identifies mechanisms of knowledge management are required to transform IT organizations to a lever rather than a barrier to integrating innovation based on emerging technologies. The study succinctly presents the convergence of knowledge assets through a cyclic process that empowers IT organization to embrace innovation.

1 INTRODUCTION

Companies are in the process of implementing emerging technologies in IT (EIT), however, they have reached varying stages of implementation. Emerging technologies in IT are technologies such as cloud, business automation and customer facing innovations that have the potential to innovate the way business is conducted translating into increased value propositions to customers internal and/or external to the firm.

The disruption introduced by emerging IT into the existing infrastructure (Dan and Chang Chieh, 2010) drives change into the IT organization (Tushman and Anderson, 1986) requiring capabilities that are required to dynamically adapt through the proficient collaboration of people, processes and technology (Mocker and Teubner, 2005). Trials in operationalizing innovation (i.e. advancing new technology from the lab to operations) affect the ability of IT organizations to implement and support these technologies. Hence, successful innovations based on IT depend greatly on the combination of the technology, the organization's technical expertise, and the organization's ability to make effective use of the new capabilities. In a dynamic competitive environment, this is a clear challenge for the IT operation consisting of both tacit (knowledge and

management competence) and explicit elements (operational procedures and standards) which translate to business performance metrics that could be measured and reported by IT practitioners through service management metrics specifically service continuity.

Rapid change in EIT causes problems for IT managers as they try to integrate these technologies into an existing environment. Inevitably, this is a drain on the resources that support the technology deployments (Benamati and Lederer, 2010). The challenges facing IT organization are hence elevated to a level at which mechanisms that were effective a few years ago have to be significantly overhauled. These challenges are mostly linked to conflicting priorities, integration issues, the availability of the knowledge/skills required, and inadequate infrastructure capabilities. Sometimes insurmountable these challenges leave the firm incapable to incorporate emerging information technologies into their business model. In practitioner circles, IT organizations are perceived as a hindrance rather than an enabler to innovation.

The paper treats these challenges in the context of IT organizations of IT services companies. For these companies, emerging IT is not just a tool to support business processes or to enable business model innovation, but for both. These organizations are

often asked to be the internal IT provider for the internal customers (i.e. employees) and external solutions and service providers for IT clients (i.e. customers). What mechanisms of knowledge management are required to transform IT organizations to a lever rather than a barrier to integrating innovation based on emerging technologies?

2 BACKGROUND

When innovating a business model, IT leadership and IT organizations, endure multi-dimensional challenges, especially in IT services companies. These IT organizations must participate in the success of their host companies in an effort to lead IT based innovation, internally and externally. IT organizations in IT service companies have two customers: IT is not only a cornerstone for the internal business model with internal users of the company, but also the core business in providing customer facing services (Keel et al, 2007). This puts a burden on the IT organization stretching its abilities to cover users' issues internal and external to the company context with a persisting conundrum of providing a reliable service to existing customers or creating new customer through innovation (Berthon et al, 1999). For instance, obstacles to knowledge acquisition and training demands, product procurement dilemmas, implementation and support prevail (Edwards and Peppard, 1997).

2.1 Organizational Capability

Largely, IT organizational capabilities have received a fair share of attention in various context. IS research on resource based views (RBV) delineates resources as physical capital (e.g. property, plant, etc.), human capital (e.g. people, experience, relationships, etc.) and organizational capital (e.g. organizational structure and processes, etc.) (Barney, 1991). Although resources and capabilities may be considered part of a firm's total assets, a capability is the organizational ability to coordinate a set of resources (human, financial, organizational or data, etc.) to create a certain outcome (Grant, 1991).

Closer to the technology implementation function, IT capability was described as the ability to diffuse or support a wide variety of hardware and software (Byrd and Turner, 2000); ultimately using enterprise management systems of IT integration (Galliers and Leidner, 2014), for knowledge and workflow management (Mulligan, 2002). On the

other hand, researchers position knowledge as a "baseline for the serviceability and the maintainability" of the components and systems involved in providing IT services in continuity that is in line with the current and planned business requirements (Blanchard, 1995). Teece et al. (1997) define "dynamic capabilities" as "*the firm's ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments*" (p. 516). The argument is made that dynamic capabilities are shaped by the coevolution of these learning mechanisms was expressly made (Zollo and Winter, 2002).

2.2 Knowledge Transfer as Essential Organizational Capability

Dynamic capabilities are enabled by knowledge infrastructures (Easterby-Smith and Prieto, 2008). In organizational learning contexts, the organization's capability to take on the associated learning curve was related to the organization's absorptive capacity (Cohen and Levinthal, 1990). Certain organizations are able to acquire and assimilate new external knowledge, but are not able to transform and exploit it successfully in order to create value from their absorptive capacity (Kranz et al, 2016). These capabilities rely fundamentally on the organization's absorptive capacity and build on prior development of its constituent, individual, absorptive capacities (Lane et al, 2006). Mechanisms associated with the coordination capabilities (i.e. cross-functional interfaces, participation, and job rotation) primarily enhance potential absorptive capacity increasing the acquisition, assimilation and transformation of new external knowledge. This component of absorptive capacity provides organizational units with strategic advantages (Lai et al, 2016), such as greater flexibility in reconfiguring resources (Tsai, 2001), and effective timing of knowledge deployment (Szulanski and Jensen, 2016). Certainly, a moderating effect of knowledge complexity on the relationship between organizational learning capability and technological innovation implementation was indicated (Mat and Razak, 2011), and related to organizational attributes (Forés et Camisón, 2016). External knowledge transfer was identified as a key factor in integrating technology (Frank and Ribeiro, 2014) and an antecedent to innovation integration (Teo and Bhattacharjee, 2014). Outsourcing activities, often including a strategic partner were identified to facilitate the knowledge transfer into the organization (Naghavi and Ottaviano, 2010). Further, research has posited that organizations acquire

information and transform it into collective knowledge assets (Legris and Collette, 2006) often through the use of knowledge management systems (KMS) (Alavi and Leidner, 2001) with a strong dependency on IT leadership communication and governance practices.

Leadership capabilities in fostering business to IT communication and governance as well as the readiness of IT and the level of stakeholder participation are critical success factors (Rau, 2004). Handoff and communication best practices between advance technology groups and operations groups help drive knowledge diffusion into the organizational structure (Esteva, et al, 2006).

Nonaka's broad contribution to the theory of organizational knowledge creation (Nonaka, 1994) emphasizes that organizational knowledge is created through a continuous dialogue and transformation between tacit and explicit knowledge (Nonaka, et al, 1996). However, such models can be highly theoretical with empirical shortcomings of information divergence into inadequate knowledge creation that may overlook concepts of culture, context and objectives for this transformation (Gourlay, 2003). Thus, as it relates to the innovation capability of IT organizations, a gap can be identified.

Nevertheless, the extant literature lacks mechanisms by which IT organizations maintain the level of knowledge and knowledge transfer capabilities required to confidently integrate emerging IT in a dynamic environment of rapid technological change. Theory has not yet addressed potential obstacles to business model innovation based on emerging IT integration that may constrain knowledge acquisition and transfer capabilities of the IT organization that is involved in integrating emerging technologies and hinder IT from building on organizational knowledge.

This paper explores how IT organizations in IT services companies apply knowledge acquisition practices to transition themselves to a lever rather than a barrier to integrating innovation.

3 METHODOLOGY

This exploratory research into practice levers two in-depth qualitative case studies (Yin, 2009). Case study methodology has been used to study knowledge transfer practices in similar contexts (Chugh, 2015; Rottman, 2008; Lee and Lee, 2000). Research activities followed a case study protocol (Appendix - Table 1) conducted in three stages, on location with IT organizations in a telecom services **Company A**,

and in an application hosting services **Company B**, selected purposefully (Patton, 1990) for this study.

3.1 Site Selection

Company A is a leading internet services provider and hosting solutions, established in 1995 with 130+ employees. The IT organization is composed of 15 members managing security credentials, moves and changes of the internal users; planning of new technology deployment; internal and external customers. Over a 2.5 year project launched in the beginning of 2010, **Company A** implemented a new business process management application based on emerging BPM (Business Process Management) technology to support the operational activities of the company in delivering these new services and reporting on the related activities. Leveraging BPM, **Company A** adapted the way of doing business and changed the operational systems, organizational structures and pricing models, to support the integration of the new mobile services in the market. The disruption to the IT organization and the business organization was substantial. The IT management team faced a user base resisting change and reluctance from the IT staff to adopt and adapt the new application.

Company B's business, on the other hand, is in hosting and cloud services, re-established in 2006 with 42 employees in total. 12 employees form the IT organization in charge of the planning, implementation and support of the internal infrastructure with a service desk attending to escalated customer calls. With a challenge to serve the internal IT needs and the needs of external customers, such as onsite support, the IT organization of **Company B** was reluctant to use the emerging cloud technologies even for their internal systems. IT leadership had to manoeuvre their IT organization to support a public cloud service. From reallocating budgets to hiring qualified consultants to supplement the resources and transition the knowledge, the IT organization of **Company B**, in face of this disruption, had to leverage the company resources properly and extensive employee training and knowledge building programs were implemented. Additionally, in order to support this new service, **Company B** needed a service desk and a portal to be integrated into their application hosting services support platform in order to provide the customer required service levels. This presented yet another disruption and exposed the already burdened IT organization supporting the customer facing services to undertake an internal project.

Similarities in the sites selected reinforce the findings by adding depth into the discovery; similarities to note are of industry context (Miles et al., 2000), culture (Kwon, 1990), international presence (Zmud, 1982), IT organization setting: centralized management model (Damanpour, 1991) with a collective decision making (Rogers, 1962). These sites also present complementarities where by **Company A** implemented an internally facing solution to enable an external service and **Company B** deployed a solution that is used by both internal and external customers. The choice of these sites aimed to uncover potential cross case observations further enriching the empirical study. The sites differ in organization size (Fichman and Kemerer, 1997), maturity (Kwon 1990; Grover and Goslar, 1993) and the scope of their project implementation.

3.2 Data Collection and Analysis

Data Collection instruments were developed to capture input from the activities (Appendix – Table 2). A preparation meeting set the stage for the activities and helped identify key informants that could represent a cross section of institutional knowledge. Discovery workshops followed with data collection activities that combined interviews and brainstorming sessions (Hargadon and Sutton, 1997). Focus group workshops were conducted due to the nature of the topic that requires stimulation and interaction (Stewart et al, 2007). These workshops recorded all the participants' input while probing for details; where possible, using illustrative examples to help establish neutrality in the process (Patton, 1990). In total data collection involved 15 informants chosen from the two companies. Saturation interviews were subsequently conducted with senior managers from each company. Case summaries and cross-case comparison were compiled in a tabular summary (Creswell, 1998), in the form of interview transcripts, field notes from observations, and relevant exhibits (e.g. organizational structures, web sites of each company, company presentations material). The data analysis investigated the data correlation through a predefined coding system (Miles and Huberman, 1991) in order to organize the data and provide a means to introduce the interpretations (Strauss and Corbin, 1990). A step by step 'Key Point' coding technique (Allan, 2003) was applied to the interview transcripts (Douglas, 2003), and relevant concepts are identified. Finally, an open discussion forum was conducted among all participant at each company separately in order to deepen the concepts.

This paper is part of a developed study. It focuses on one Key Concept of *Knowledge Acquisition* that is isolated by the coding technique to support the findings and focus on one significant observation (Appendix – Table 3). Codes to the seed concept were grounded in the literature with references to notions of seeking external knowledge (Pugh and Prusak, 2013), transferring of acquired knowledge (Alavi and Leidner, 2001; Gatewood, 2009), and internal diffusion of acquired knowledge (Roberts et al, 2012); then exploiting this knowledge in participation in decision making (Jansen et al, 2005; Xue et al, 2008) and training (Edwards and Peppard, 1997). Concepts are allowed to emerge from the coding technique. The coding results were then shared in a discussion with the participants in focus group sessions for validation and additional input.

4 FINDINGS AND DISCUSSION

The case study has revealed that through training of IT in both technology and in the related business aspects, IT organizations in the IT services industry were able to shape their technical and analytical capability (i.e. analysis of the business requirements, ROI, business value of technology) and become enablers of innovation. IT organizations previewed the business and technical benefits of potential solutions. This was an opportunity to embed visionary and forward looking IT solutions into the firm. The IT Director of Company A explicated that *"This tactic has fuelled the enthusiasm of the IT organization and raised the confidence of the business in the IT organization and elevated the value of the IT organization to the business."* The IT organization became part of the strategic trend setting capacity of the organization, which encouraged the members of the IT organization to embrace the new deployment. The opportunity to lead internally reportedly raised the "confidence" of the business in IT organizational capabilities and encourages the IT organization to embrace the new technology. IT became an agent of change, elevating the value of IT in the organization and innovating the business. The IT organization was then empowered to drive the next phases of the implementation of the IT based business innovation. For instance, the IT team of Company A was involved in all new systems introductions and the IT organization, in the case of the BPM implementation, was able to introduce process automation initiatives and be a leader in the company's business model innovation. IT leadership managed to "push other concepts that were originally

outside the scope of the current project such as shopping carts, self-service and collection activities, integration of handhelds, enabling the POS platforms and other mobile applications, added the Director of IT, explaining how such approaches expanded the innovative aspect of the solution and helped drive a niche service offering to the market.

4.1 Knowledge Acquisition Practices

Indeed, knowledge acquisition practices were identified as key enablers to IT organizational capabilities. Both companies suggested that IT organizations could be better prepared for the integration of EIT primarily through *Knowledge Acquisition mechanisms* of training, seeking external knowledge and sharing it internally.

For **Company A**, the IT organization's learning capabilities were enhanced by attending conferences: an opportunity to network with peers and learn then disseminate the knowledge internally. *"First we send them to conference. They will then have a chance to network with peers and learn, gain the confidence with the technology and come and convey the knowledge internally"* indicated the operations manager of **Company A**. The degree of tacit-ness of newly acquired knowledge necessitated richer organizational information processing mechanisms. An integration working group made up of cross organizational members and representations of IT in the business led the knowledge transfer in **Company A**. Job rotations enhanced knowledge redistribution among the technical IT team members. In order to address the architectural implications and learn about potential system interaction with existing systems (e.g. Active Directory support), **Company A** started architectural review session emphasizing the role of external consultants in order to insource the required knowledge.

On the other hand, organizational dynamics of socialization (the perspective of a group rather than an individual) practiced by the IT organization stimulated **Company B**'s sales team to increase the organization's business-IT knowledge. The participation of IT in the process of decision making primarily strengthened the realized absorptive capacity (Jansen et al, 2005) of the IT organization and elevated the organization's capability to strengthen their business-IT knowledge. **Company B** conducted research of other implementations in peer organizations in a form of knowledge networks with the objective of insourcing the required knowledge. Thus, external knowledge was sought through the engagement of consultants and joint R&D activities

with key providers and partners. Testing and R&D activities enriched the individual skills of the IT employees. Their accumulated experience increased the levels of organizational knowledge. *"... We setup R&D efforts with peer organizations, key partners and suppliers and review and research other implementations in peer organizations"* (**Company B**). Learning capability of experimentation (Cohen and Levinthal, 1990), and interaction with external environments (Varis and Littunen, 2010) were shown by research studies to positively associate with the introduction of novel product innovations in firms.

4.2 Knowledge Transfer Tactics

The transfer of knowledge to internal customers (i.e. employees of the company) was accomplished through user training sessions and users' manuals. The task for the IT organization was then also to participate in *"educating the customer to increase the enthusiasm at the customer level"*. This helped **Company A** overcome users' resistance to adopting the new business process management (BPM) platform and eased the task on the IT organization. Case management and monitoring tools provided feedback from the customer into the business planning to drive alignment of the objectives of the business. Such tools enabled the IT organization of **Company A** to gain visibility into the customer experience and to measure the service health (metrics) through related monitoring and reporting functions. This awareness incentivized the IT organization to handle the implementation of EIT with the knowledge of the impacts it had on the customer.

Collaboration and brainstorming sessions helped disseminate the acquired knowledge and knowledge management systems consolidated this knowledge in to an information base on internal and external customers. **Company B** used this convergence of information to participate in delivering the vision internally with an enthusiasm to contribute input. The operations executive of **Company B** described that *"knowledge transfer tactics between the teams were applied. They involve the sorting and categorization of information with knowledge management systems in order to leave time for the internal functionality empowering the front lines. Through communication between these teams, the internal team is aware of the customer issues. This was fruitful in the ability of IT to participate in delivering the vision internally with an excitement, progress and ability to participate effectively in the input"*.

Extending outside the boundaries of the firm, for **Company B**, continual training plans empowered the IT organization to become more effective in supporting the customer base. Training sessions were carried in-house. Chosen team members were assigned and trained on specific technologies. They attended conferences to stay ahead of the learning curve and setup labs and databases of training materials for in-house training activities. In-house training facilitated the spread of knowledge and reduced the corresponding knowledge acquisition costs. **Company B** involved the employees, as *their internal customers*, in the deployment of hosting projects. The IT organization established biweekly knowledge sharing sessions with internal customers (employees) in order to discover the challenges and help reduce adoption issues.

In addition to the benefits received from collaboration tools, **Company B** included *knowledge management systems* in their toolset as part of their knowledge sharing strategy. These knowledge management and transfer capabilities built on the organizational knowledge to improve the operational/functional competences of **Company B** by combining *the knowledge of the customer facing technical teams and the internally facing IT infrastructure teams (Company B)*.

4.3 Exploiting the Tacit Knowledge of the Customer

Emerging from the analysis is a concept that depicts the phenomenon of exploring the tacit knowledge of the customer. This study shows a potential added value for IT organizations that collaborate with the customer of their services, especially in mitigating risks and improving eventual outcomes (Liu et al, 2013). **Company B** reported that the IT reluctance phenomena extending to their customers hindered their ability to provide their services to these customers. Learning workshops held with the customers, increased the awareness of the customer issues and reduced the customer reluctance to adopt the technology. To close the loop, IT shared lessons learned from solving customer issues with the business as they brought forth recommendation to drive more business through new products and services. This stimulated the creativity of the IT team, as a motivation to start driving the innovative ideas through to the business strategy. **Company B** reportedly focused on enhancing the consultancy skills of the engineers. The *“IT organization was a consultant to the customer ... the IT team scouted for opportunities at the customers’ base, and feedback is*

brought back to the business” clarified the operations manager. Their exposure as a consultant with the external customer motivated their creativity as they started driving the innovative ideas through to the business strategy. On the operations side, and in close communication with the customer-facing support teams, the IT organization was aware of the customer issues. The IT support team (customer facing) in **Company B** meets with the IT infrastructure team (Internal team) regularly to review the customer issues, build the knowledge base and solicit the collaboration of ideas across the technical team internal and external. Meanwhile, the customer facing support teams, share the lessons learned from solving customer issues with the business. This works as a feedback into the business of the issues facing IT which may in turn drive a business solution or a new service.

5 CONCLUSION AND GUIDANCE FOR PRACTICE

Building upon the theory of organizational knowledge creation, these findings are reminders of Nonaka’s model of spiral of organizational knowledge creation (Nonaka, 1994) through combining tacit and explicit knowledge into a cyclic process of organizational knowledge building.

Thus, our study could be considered as an empirical extension of this theory. Mechanisms for knowledge acquisition and knowledge transfer explored maybe framed reciprocally, by the two dimension of organizational knowledge creation lens: (1) mechanisms for the acquisition of knowledge that relate to the type of knowledge (tacit vs. explicit) and (2) knowledge transfer tactics that depend on level of social interaction to convert this knowledge into organizational asset.

5.1 Mechanisms for Knowledge Acquisition and Transfer

The site selection proved helpful in highlighting the different mechanisms of knowledge acquisition and transfer, however analogous, they seem nuanced relative to project scope.

In the case of **Company A**, a heightened focus was clear on building the organizational learning capabilities that addresses the internal customer needs as the project’s scope was mostly internal in scope. Job rotations were instrumental in building a deep knowledge bench. IT team members attended

conferences and networked with peers to seek external knowledge, formed cross organizational integration groups. Resorting to external resource augmentation in order to insource required new knowledge, conducting training sessions to transition knowledge to users and reduce adoption resistance. Tools deployed were case management and monitoring that gathered information and converted it into organizational knowledge.

Company B's project on the other hand, was more pervasive in scope. The customer base was preliminarily external to the firm. The IT organization had to reach outside the firm's boundary to seek new knowledge through the engagement of consultants and joint R&D activities with key providers and partners, researching other implementations in peer organizations in a form of knowledge networks with the objective of insourcing the required knowledge. Collaboration and brainstorming sessions among members of the IT organization the acquired knowledge and knowledge management systems consolidated this knowledge in to an information base on internal and external customers. Continual training plans empowered the IT organization to become more effective in supporting the customer base and learning workshops held with the customers, increased the awareness of the customer issues and reduced the customer reluctance to adopt the technology. They also included knowledge management systems in their toolset as part of their knowledge sharing strategy.

5.2 Enabling IT Organization's Capability for Innovation

In either case, the empirical statements explicate that IT organization embrace innovation integration by reinforcing knowledge acquisition practices through training, collaborations with key partners and suppliers, testing and R&D. IT organizations reportedly gained confidence with emerging technology integration by capitalizing upon learning opportunities from peer networks, consultants and conducting joint R&D activities with key providers and partners. Acquired knowledge is then shared internally in cooperation with the business and other team members through the integration of new ideas with the use of knowledge management tools, research and testing practices. Tools for knowledge management consolidated this knowledge into an information base on external and external customers.

In both cases, the customer was an integral part of the knowledge institutionalization process. In one case (Company A), internal testing and R&D

activities enriched the individual skills of the employees. The participation of IT in the process of decision making elevated the organization's capability to strengthen their business-IT knowledge and job rotations enhanced knowledge redistribution among the technical IT team members. Acquired knowledge is mutualized in a collaborative approach with customers. The IT organization learns about the customer issues (supporting them more effectively) and about their needs and requirements, which reinforced the ability of IT to support the vision of the business. A suggestion that customer collaboration would likely ease of adoption of the new service (especially for the internal customer of the IT organization), and prepare the IT organization for the potential risk induced by the emerging technologies to the external customer. Integration working groups connect with the business to gain insight into the business requirements from IT and gauge the business readiness for the IT innovation. Then cooperating with customers (i.e. *internal customer of IT and external customer of the business and IT*) in testing, planning, and risk assessment, IT organizations could influence the customer's readiness for integrating innovation. Furthermore, collaboration and brainstorming sessions helped disseminate the acquired knowledge. Integration working groups made up of cross organizational members and representations of IT in the business lead the knowledge transfer. Integration working groups connect with the business to gain insight into the business requirements from IT and gauge the business readiness for the IT innovation.

5.3 Emphasizing the Confluence of Knowledge

This study shows that IT organizations must continually build, adapt, and reconfigure their competences to succeed in a changing environment through knowledge acquisition and transfer mechanisms. These mechanisms underscore the development of dynamic organizational capabilities of exploration and exploitation, emphasizing the confluence of knowledge. Investments are required to build IT skills and competence, muster key resources, and formalize key activities. Innovative IT organizations develop key partnership with suppliers and peers, and exploit the tacit knowledge of the customer. IT leadership of confident organizations drive their organizational capabilities to become levers for business model innovation. They motivate their IT organizational learning capabilities, and reinforce their analytical capabilities. They

demonstrate leadership competence, encourage the adoption of standards and networking with peers.

Learnings from this study highlight the fact that the confluence of knowledge from the customer base, the business, peer organizations, standards and best practices, has the potential of increasing the exploratory and exploitative capabilities, raising the awareness, analytical skills and the confidence of IT organizations to “integrate new ideas and embrace emerging technologies”. Knowledge flow between the exploratory and the exploitative IT teams (Jansen et al, 2009) converges into a potential for innovation (Appendix – Fig. 1). This confluence of knowledge becomes a cyclic process of exploration and exploitation of knowledge assets in a perpetual knowledge sharing ecosystem that yields to a continuous organizational learning with significant value to organization capability building.

5.4 Limitations and Opportunities for Further Research

This paper is part of a larger research effort exploring mechanisms of innovation integration employed by IT organizations (Badr, 2014; 2015; 2016). The specific topic of this paper treats those mechanisms of knowledge management adopted to prepare IT organizations for innovation integration. Findings of this study corroborate evidence that tacit knowledge transfer is often supported by open communication, peer-trust and unrestricted sharing of knowledge (Chugh, 2015). Although the research has reached its aim, some unavoidable limitations can be noted. The study was conducted in two companies, hence limits the generalisability of the findings. Limitations related to case study research the research and other contexts such as culture and industry can be recognized (Al-Ammary, 2014).

The indicated limitations of this study could offer opportunities for follow on research. For instance, additional field work possibly in the form of wider focus groups, with chief information officers, IS professionals and consultants (Rosemann and Vessey, 2005) would examine the applicability of the framework in other cultural, organizational and other contexts, in order to strengthen the practice implications of the concepts introduced by this study (Rosemann and Vessey, 2008). Academic researchers in IT innovation, MIS, organizational dynamic capabilities and resource based views would find the opportunity to exploit the findings of this study into interesting quantitative and qualitative projects.

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APPENDIX

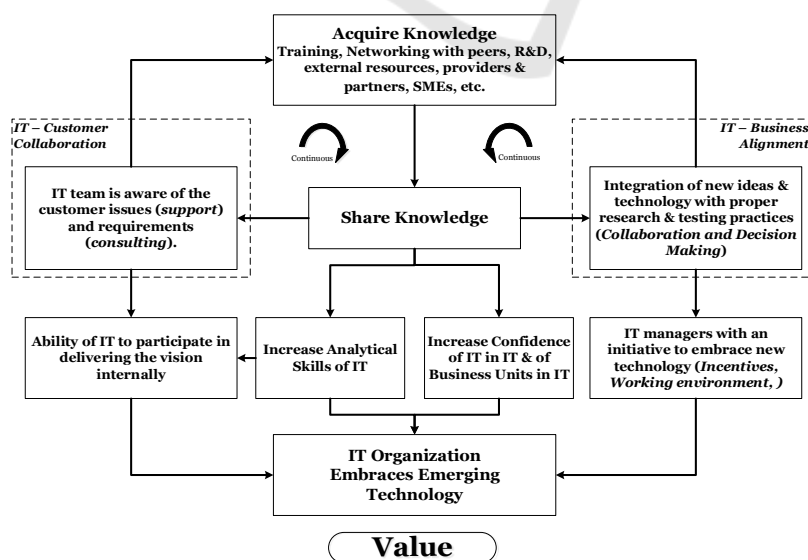


Figure 1: A Confluence of knowledge for continual organizational learning.

Table 1: Case Study Protocol.

Stage	Activity	Participants (A)	Participants (B)
Preparation Meeting	Semi-structured (1:1) interview with the primary contact; Identify and collect secondary data documents and artefacts; Review company and IT organizational structure; Identify stakeholders for the data collection stages	Director of IT	Deputy GM / Operations Director
Stage 1 “Discovery” workshop	Conduct the first “discovery” workshop (middle management); Gather collective knowledge on the mechanisms that reduce reluctance of the IT organization to integrate emerging technology innovations in IT	Director of IT; IT Admin.; IT Project Mgr.; MIS Systems Analyst; IT Systems Mgr.; MIS / IT Mgr.	Deputy GM / Operations Dir.; Infrastructure Mgr. Customer Support Mgr. Customer Support Sup. Sr. Sys. Engineer
Stage 2 - Saturation	Conduct semi-structured interviews (senior level management); Collect additional detail on the role of leadership and seek saturation of the concepts	General Manager; VP of Sales	General Manager / Sales Manager
Develop Case Reports	Create individual summary of each transcript (reduction process) and combine case response and individual transcript summaries.		
Stage 3 - Discussion	Conduct the second “Discussion” workshop; Unstructured discussion and feedback workshop for member checking and validation	Same as stage 1	Same as stage 1

Table 2: Research Instrument.

Stage	Data Collection Instrument
Preparation Meeting	<p>PrepQ1: What challenges does the IT organization face when supporting both internal and external customers? ... Any benefits?</p> <p>PrepQ2: What is the role of IT leadership in reducing the reluctance of your IT organization to integrate innovation?</p> <p>PrepQ3: What components of the IT Strategy have you considered in order to reduce the reluctance of the IT organization (Innovation and operation)?</p> <p>PrepQ4: Can the IT organization be a lever rather than a barrier to radical innovation based on EIT? How?</p>
Stage 1 “Discovery” workshop	<p>Exercise 1: During the business model innovation project, identify obstacles, investments and mechanisms or processes used to address these obstacles and prepare the organization for the integration of emerging technologies IT. (Answers prefixed by M for mechanisms & O for obstacles)</p> <p>Exercise 2: During the business model innovation project, identify reasons why the IT organization was reluctant to integrate emerging technologies in IT.</p> <p>Exercise 3: Identify mechanisms that reduced reluctance of your IT organization to integrate innovation, consolidate the input from the first exercise to derive deeper feedback.</p> <p>Concluding Question S1: How can the IT organization be a lever rather than a barrier to radical innovation based on emerging technologies in IT?</p>
Stage 2 - Saturation	<p>FollowQ1: How do you adopt and institutionalize emerging technologies in IT?</p> <p>FollowQ2: In the business model innovation project integrating emerging technologies in IT (the specific project), what issues did you observe in transitioning innovation into operation? In the project, what were the operational barriers? How did you address them?</p> <p>FollowQ3: What is the role of IT leadership in reducing the reluctance of your IT Organization to integrate innovation – in general and relative to this project?</p> <p>FollowQ4: What components of the IT Strategy have you considered in order to reduce the reluctance of the IT Organization to integrate Innovation – can you please share a copy of the strategic plan?</p> <p>FollowQ5: How were these mechanisms implemented, by whom and what results were seen?</p> <p>FollowQ6: Can the IT organization be a lever rather than a barrier to radical innovation based on emerging technologies in IT? How?</p>
Stage 3 - Discussion	Unstructured discussion and feedback workshop for member checking and validation.

Note: This paper is part of a larger outcome of a developed study. For completeness, the instrument above is presented in its entirety with relevant questions to this paper highlighted in bold.

Table 3: Key codes related to the seed concept of Knowledge acquisition (Partial results related to this seed concept).

Key Code	Empirical Statements (Parenthetic numbers indicate the frequency of occurrence in the statements and prefixes indicate a reference to the data collection instrument)
Concept: Knowledge Acquisition	
Acquire new knowledge (Roberts et al., 2012)	O3.1.B “Acquire new knowledge internally and reduce the reliance on suppliers O1.2.A “Develop awareness about alternative solutions through research and library searches (2) PrepQ2.A5: “Learning capabilities, collaboration and internal information exchange through the training and cross training of technical staff.
Seek external knowledge (Pugh & Prusak, 2013)	M7.1.A “Hired an external consultant to provide workshops for requirements definition and draft an initial plan to implement these requirements M3.2.B “Identify key providers and setup joint R&D teams with them M5.1.B “Setup R&D efforts with peer organizations, key partners and suppliers. M4.2.B “Review and research other implementations in peer organizations M3.2.A Started architectural review session emphasizing the role of external consultants in order to insource the required knowledge
Concept: Knowledge Transfer	
Transfer acquired knowledge (Alavi & Leidner, 2001; Gatewood, 2009)	O1.5.B “Establish regular (bi-weekly) knowledge sharing sessions”. O1.4.B “Setup a database of training materials” O1.3.B “Setup knowledge management systems that may reduce the cost of individual training for each of the team members and allow for information sharing” M1.4.A “Perform many user training sessions and develop easy to use users’ manuals PrepQ2.B5 “Knowledge transfer tactics between the teams ... the sorting and categorization of information with knowledge management systems”... PrepQ2.A5 “At some opportunities, an extended staff meeting would be necessary to synchronize the information and normalize it across the IT organization”. S1.B2 “Share IT knowledge across the IT organization S1.B4 “The organization shares business decisions with all technical employees FollowQ6.A7. “... knowledge acquisition is the basis of everything... all means of knowledge acquisition and sharing should be leveraged.”
Training activities (Edwards & Peppard, 1997; Roberts et al., 2012)	M1.1.B “Conduct internal training sessions (train the trainer) and bring the training in-house” (2) M6.1.B “Training of chosen people assigned to specific technologies” O5.1.B “Attend conferences to stay ahead of the learning curve” O1.2.B “Setup labs for the training activities to be carried in-house” O1.3.A “Training the IT team on technology” (4) PrepQ2.B5 “provide education and incentive programs related to uptime and resolution time, PrepQ2.B5... “The teams will undertake in the next few month a training session to update them on the latest in ITIL from service and support to strategy” PrepQ2. B5 “First we send them to conference. They will then have a chance to network with peers and learn, gain the confidence with the technology and come and convey the knowledge internally”. S1.B3 “Invest in training for products and technologies”
Participation in decision making (Jansen et al, 2005; Xue et al., 2008)	PrepQ2.A5 “With the right analysis – a deep analysis of the potential technology, involving nearly everyone on the team, while pushing collaboration with experts in building the big picture...”. PrepQ2.A5 “We need to discuss and consider input from all team members...” PrepQ2.B5 “In order to keep the IT organization engaged in realizing the objectives, we involved them in the decisions”
Emerging Concept: Explore the tacit knowledge of the customer	
Explore the tacit knowledge of the customer	PrepQ1.B5. “The IT support team meets with the IT infrastructure team regularly to review the customer issues, build the knowledge base and solicit the collaboration of ideas across the technical team internal and external”. S1.B6 “Share the lessons learned from solving customer issues with the business. This works as a feedback into the business of the issues facing IT which may in turn drive a business solution or a new service”. FollowQ6.A “we participate in educating customers to increase the enthusiasm at the customer level” PrepQ4.B “IT organization was a consultant to the customer ... the IT team scouted for opportunities at the customers’ base, and feedback is brought back to the business”