Empowering IT Organizations' Capabilities of Emerging Technology Integration Through User Participation in Innovations Based on IT

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Abstract To innovate their business models companies often rely on emerging technologies in IT. Disruption introduced by emerging IT affects the stability of the IT services, and the ability of IT organizations to sustain the continuity of services required by the business. Thus, IT organizations are perceived as a hindrance rather than an enabler to innovation. Through a systematic review of the literature, this paper shows that "user participation" writings focus mostly on the "client" of the technology and overlooks the capabilities needed to empower IT organizations capabilities to integrate innovations in IT. Through in-depth case studies in IT services companies, the research learns what mechanisms of user participation in IT innovation would enhance or improve these capabilities. Relating to the IT capabilities of exploitation and exploration, the results recommend some practices of collaboration and user participation that could enable IT organizations' to more effectively integrate emerging technology in IT.

Keywords IT organizational capabilities · Consequences of adoption · Consequences of IT diffusion · Obstacles to integration · IT learning capabilities · Emerging IT integration

1 Introduction

Information Technology establishes a foundation for strategic innovations in business processes [1], sets up modular components aligned with standard business processes [2], and provides the basis for development and implementation of present and future business applications for a competitive edge [3, 4]. Emerging technologies in IT (EIT) are those technologies at the "*earlier stages of their lifecycles and have been adopted by less than 20 % of their target population*" (Gartner IT Glossary). IT innovations in form of emerging technologies in IT such

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as cloud computing, communication, collaboration, social networking, mobile, and search engine tools continue to play an integral role in supporting corporate innovation [5–7].

Companies are in the process of implementing emerging technologies in IT, however, they are at varying stages of implementation. 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 [8]. Disruption introduced by emerging IT affects the stability of the IT services, and challenges the ability of IT organizations to sustain the continuity of services required for business continuity [9]. Challenges in operationalizing this innovation (i.e. *advancing new technology from the lab to operations*) affect the ability of IT organizations to implement and support these technologies. Sometimes insurmountable these challenges leave the firm incapable to incorporate emerging information technologies into their business model. Effectively, in practitioner circles, "*IT organizations are perceived as a hindrance rather than an enabler to innovation (Cap Gemini 2014)*".

What mechanisms should IT organizations reinforce with their customers in order to hone their capabilities in the integration of emerging IT?

2 Background

Research on innovation supports innovative characteristics of emerging IT [10–14] and the disruption introduced into the IS operation [15, 16]. The literature on antecedents to innovation diffusion connected adoption characteristics such as ease of use and usefulness [17], maturity [18], and rapid change of the technology [19] to the success of the diffusion process. Factors such as managerial influences in encouraging adoption [20], mandating its use [21] or offering choice for differing levels of use [22] by organizations as a whole or by individuals that are willing to adopt technologies were addressed. Some theories considered particular adoption contexts such as propagating institutions that may have an effect on lowering the knowledge barriers of adoption [23]. Key tools and skillsets required for adoption and diffusion were explored [24].

In an advanced stage of the adoption process, researchers argue that diffusion theories should be tailored to specific classes of technologies [25] and task-technology compatibility [26]. Costs, perceived risks [27] and the likely payoffs [28] were also represented, that may affect the outcome, in success or failure to implement innovation in a way that generates net benefits [25]. Contextual factors were identified affecting IT implementation such as project and resources, end user participation, organizational structure and commitment, IT and CIO competency, and complementary investments [29]. Recent research showed that early investments in resource in an ERP project might positively affect the adoption process of the application [30]. Other mechanisms that foster an innovative culture in organizations are likely to facilitate the introduction, adoption and diffusion of innovations with a resulting effect on firm performance [31].

2.1 IT/IS Integration

In closer relation to the organizational resources, leadership, and attributes, IS integration is the outcome of the technology implementation [32]. Integration in IT is considered the sum of technology and organizational elements [33] participating in the technology diffusion process. Literature streams on IT implementation and integration found elements relating people, process, technology and knowledge assets as obstacles for the implementation of enterprise wide systems [34], specifically, in key activities of change management, prioritization, resource allocation and stakeholders' involvement [35]. IT assessment and introduction models were recommended to address barriers to technology integration [10] identifying the role of IS function in different stages of integration, discussing operational efficiency and contribution to business formulation [36] without assessing the impact on these activities on IT organizations engaged in implementing the technology.

Later research tackled organizational issues related to change in the transition from core technologies [37] and mechanisms for organizations to cope with such change [19]. A plethora of technology selection models focused on success factors [38–41] and systems quality [42] of an information system implementation, were introduced. Still, no linkages were found on the potential collaborative mechanisms that IT organizations in IT services could use with their customers to deliver the related IT services and successfully integrate innovation.

2.2 User Involvement in IT Integration

The literature on "*user involvement*" in IS/IT is copious: Antecedents and consequences of adoption and diffusion have been linked to *user involvement* in IT [43–45] and *user resistance* is seen as an inherent phenomenon in IT implementations [46, 47]. Reasons for this resistance could be many. To list a few, the extant literature discusses influences of power and politics [48], perceived threat [49], misuse [50], or external and internal influences [51], levels of sophistication of the infrastructure [52], user satisfaction [44], or organizational readiness [34]. Khoo [53] found that the maintenance of IT innovations imposed a toll on the user's as in the case of upgrades and continued development. The implementations of IT innovation were qualified as problematic "*frequently costly and time-consuming*" [54, p. 77].

On the other hand, researchers showed interest in modeling factors that influence "*user acceptance*" of technology [17] or how the IT organization is or is not promoting adoption [55]. Among factors affecting "*user acceptance*", concerns of technical compatibility, technical complexity, and relative advantage (perceived need) were deemed important [26]. In more recent publications, data privacy was a major concern for Bradford and Florin [46] in their study of accounting software

implementation; similarly, with Crum et al. [56] in the case of electronic data interchange solutions. Angst and Agarwal [57] agreed. Kuo [58] showed that personal factors of gender, age, educational background, influence technology readiness, and Lee et al. [59] introduced factors of simplicity and consistency, however as antecedents to the functions of the business. This stream in the literature focused on the "*clients*" of the technology integration efforts overlooking what capabilities IT organizations needed to cultivate in order to accomplish their objectives. The next section reviews extant literature for some guidance for IT organization to manage consequences of IT integration in order to ensure success.

2.3 IT Organizational Capabilities

Studies have outlined details on the role of IS function in different stages of integration [36] discussing operational efficiency and contribution to business formulation without assessing the impact on these activities on IT organizations. Little mention was found on managing the consequences on IT organizations of integrating uncertain investments in IT.

IT organizations commonly participate in the decision making [60, 61] for emerging IT integration. Involved at the scanning phase of the innovation process [61], IT organizations identify emerging technologies that could contribute to innovation strategies [60]. Then, they engage their resources and capabilities in the implementation and support of IT solutions [31, 34, 58, 59]. 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.…) in the seminal work of Barney [62]. IT capability was conceived as the ability to enhance competitive agility by delivering IT-based products, services, and business applications increasing the firm's capacity [63] and building sustainable competitive advantages [64]. Closer to the technology implementation function, IT capability was described as the ability to diffuse or support a wide variety of hardware and software [65].

Other references to IT capability, include the ability to respond to change [63] and mobilize IT-based resources [66] in an industry leadership position [67]; and the ability to effectively use IT tools and information to model, measure, and control business [66]. Competencies are built by combining such resources and capabilities [68] leading to the ability "*to conceive, implement, and exploit valuable IT applications*" [69, p. 491]. Recent empirical studies [70, 71] showed that firms or business units with stronger **exploration and exploitation capabilities** outperform others. Though both capabilities could be conceived as theories for learning [71], exploration capabilities are aimed at discovering new possibilities for innovation while capabilities of exploitation are intended to invest old knowledge [72] to realize operational effectiveness.

For the background of this research, **exploitation capabilities** are operational level capabilities that reflect an ability to perform routine and required activities [73] within the IT function. These capabilities include fundamental processes of operation with the required key resources such as applications, information, infrastructure and people [74]. On the other hand, the absorptive capacity [75] of IT organizations was tied to improving decision making process leading to a decision to invest in EIT. Thus, **exploration capabilities** are centered on (1) learning capability, including the notion of absorptive capacity [75], and (2) innovation capability [76]. These exploration capabilities rely on information acquisition and transformation to collective knowledge assets [31, 77].

Related to technology innovation, diffusion patterns and the presence of large assimilation gap [25] were linked to factors of innovation mindfulness [78] and technical efficiency [79] of organizations. The literature on innovation capability of an organization emphasized an organizational structure and leadership that motivates creativity [80] and idea generation. For instance, this could be realized through an internal collaboration led by distributed innovation groups on the enterprise level [60]. A reward system to drive innovative behavior and encourage creativity [14] with the appointment of innovation champions [81] and employment diversity [82] were touted as encouragement for innovative and incremental development activities.

Thus, the literature presents mechanisms that foster an innovative culture in organizations which facilitate the introduction, adoption and diffusion of innovations showing a resulting effect on firm performance [28] and consequences of technology integration initiatives. Nevertheless, the literature lacks guidance on how IT organization could hone their capabilities in order to drive these initiatives and none of the reviewed literature addressed potential methods used by IT organizations to engage their customer in such innovation process. Learnings from the two cases presented in this paper, would be a welcome addition to topical concepts in academic research and a valuable guidance in practice for IT organizations to engage their internal and external customers in the integration process of emerging IT.

3 Methodology

This research explores major challenges to IT organizations and mechanisms that these organizations employ with their customers in order to hone their capability in emerging IT integration. This exploratory research into practice takes the form of qualitative case studies [83, 84]. In line with similar work in IS case study research using two cases for a comparative study [85–91].

3.1 Site Selection

The two sites in this study are IT service companies. IT organizations in these companies have two customers [92]: 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. This puts an added burden on the IT organization to stretch the abilities and 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 [93].

The two in-depth case explorations are conducted on location with IT organizations in Telecom **Company A**, and in application hosting services **Company B**, selected purposefully [94] for this research (Table 1). The sites are analogous in their IT organizational setting with a centralized IT management [95] and a collective decision making [96], the IT organization in both companies performed similar duties and shared comparable responsibilities in managing and maintaining IT services supporting both internal and customer facing services. Both companies are IT services companies providing IT services for Lebanon and the MENA (*Middle East and North Africa region*). The similarities in the sites selected could reinforce the findings by adding depth into the discovery; similarities to note are of industry context [97], culture [98], and international presence [99], with IT a centralized management model [95] and a collective decision making [96].

Table 1 Summary for the two site case study

	Company A	Company B
Company background	Leading internet services provider and hosting solutions, established in 1995 (130 + employees)	Hosting and cloud services, re-established in 2006 (42 employees)
IT organization	15 members managing security credentials, internal moves and changes; planning of new technology deployment; internal and external customers	12 employees in charge of planning, implementation and support of internal infrastructure with a service desk attending to escalated customer calls
Emerging IT integration objectives	Streamlined business processes, partners, resources in order to introduce new network features to existing customers	Enabled them to position services in a niche market with added value to their existing and new customers
Risk mitigation measures	Clear definition of risks on IT and the business to leverage company resources and accomplish the business objectives	Informed on the challenges and risks, customers participated in creating the solution to mitigate the risks
Realized value	Extended their network delivering 3G/4G services to subscribers	Provide a turnkey IT solution based on software as a service (SAAS)

These sites also present complementarities that may shed a light on some cross case observations further enriching the empirical study. The sites differ in organization size [100] and maturity [101]. Though both companies were chosen to have similar characteristics in culture [98] and international presence [99], in the preliminary exploration, these sites have presented variances into their approaches such as involving customers [102, 103] in the process of integrating EIT into **Company B**'s customer facing and internal operations [11].

3.2 Data Collection

Data collection activities (Dec 13, 2012–April 3, 2013) combined interviews and brainstorming sessions [104]. Focus group workshops [105] were conducted due to the nature of the topic that requires stimulation and interaction. These workshops recorded all the participants' input while probing for details; where possible, using illustrative examples [94] to help establish neutrality in the process. In total data collection involved 15 informants chosen from the two companies. Interviews were conducted with the managers in charge of IT, operations, sales and general Managers at each company. Focus group participants were managers and members of customer support teams, IT administration, Infrastructure design and implementation teams and the project management office. The interviews were in two waves, before and after the focus group exercise in a form of member checking [106] in order to assess the usefulness of the study. Secondary data sources (presentation manual, user's manuals, tools and web sites) were reviewed for information on company and IT organizational structure (construct validity).

3.3 Data Analysis

Case summaries and cross-case comparison were compiled in a tabular summary [107], in the form of interview transcripts directly after the field activities [108], including field notes from observations and relevant exhibits (e.g. organizational structures). The timely and detailed transcripts heightened the accuracy of what was reported, supporting the descriptive validity [109]. Nevertheless, the study's reliability is reinforced through the use of a case study protocol, the consistent review of the data, observations, and discussions and a systematic case study methodology [110]. The analysis investigated data correlation through a predefined coding system [111] in order to organize these data and provide a means to introduce the interpretations [112]. Grounded in the literature review, a step by step coding technique [113] was applied to the interview transcripts [114], and relevant concepts are identified. 'Key Points' for the coding are shown in Table 2 as potential effects of the mechanisms employed on the IT capabilities grouped under categories

Table 2 Key point codes

Capability of IT	Potential effect (key point)
Exploitation capabilities	Enhance operational level capabilities
	Reduce the risk at the customer end
	Enhance support capability
Learning capability	Improve learning capability (acquire and disseminate knowledge)
Innovation capabilities	Drive more business opportunities and add value with an enhanced ability of IT to participate in delivering the vision internally
	Bolster innovation capabilities (new ideas for new products)

of exploitation, learning and innovation capability. Following the coding exercise, data analysis was completed by category and organized in relevance to the research question (see Appendix).

4 Findings

Obstacles to integrating innovations were extant in the empirical data. These obstacles include a plethora of user resistance issues reportedly caused by the level of sophistication, potential effect on stability of services, architectural implications, and system interaction with existing systems. This came with no surprise.

Findings from the empirical data exhibit a few interesting concepts (Table 3). Findings are represented as a set of mechanisms employed with their reported potential effect on the IT organizational capabilities. Mechanisms that IT organizations applied in collaboration with internal and external customers were connected to capabilities of exploitation, learning and innovation.

5 Discussion

The informants revealed mechanisms of user participation that IT organizations applied in collaboration with the internal and external customers. **Company A** found "*a lot of reluctance imminent from the customer which inhibited the ability of the company to deploy their new services*". To convert a risk averse customer, both companies reported having to engage in a collaborative exchange of knowledge with their respective customers. These mechanisms were stated to present an effect of risk reduction at the customer end thus reducing user reluctance to innovation integration.

Spears and Barki [45] reinforced the importance of the users' awareness of risks [13], **Company B** included their internal (users) and external customers in the assessment of risk which helped prepare the organization for the integration of EIT. With risk averse customers, **Company B** "*established a collaborative exchange of*

Table 3 Findings from empirical analysis—mechanisms applied

	Mechanisms that IT organizations applied	Potential effect
IT exploitation capability	Align internal deployments with external customer needs	Enhance operational level capabilities
	Customers drive implementation standards	
	Project deployment in phases	
	Collaboration to encourage the customer to accept the technology (workshops subject matter experts)	Reduce the risk at the customer end
	Engage in education to convert risk averse customer	
IT learning capability	Collaboration between internal and external facing IT	Improve learning capability (acquire and disseminate knowledge—external user/customer)
	External facing IT teams collaborate with customers	
	Include customer in the definition, testing and validation of new products and services	
	Establish training plans/training for customers	
	Employee training and knowledge building programs	Improve learning capability (acquire and disseminate knowledge—internal user)
	Employees involved in the deployment of the projects	
	Deploy knowledge management systems to manage customer issues (lessons learned extracted from support ticket database)	
	Establish technology champions to transition knowledge	
IT innovation capability	Engage IT team in consultancy services to customer.	Ability to participate in delivering the vision internally
	IT team scouts for opportunities at the customers' base. (Drive more business opportunities/add value)	
	Collaborate with customer to define new product strategies (co-creation) and consult customers evaluation of new technologies	Bolster innovation capabilities (new ideas for new products)

knowledge and engaged in an education process to help them get over the risky nature of the technology." They performed "*joint assessments with the customer resources and mapped the risks directly to customer expectations.*"

5.1 Enhancing Exploitation Capability

In order to enhance their capability to deploy the solution, **Company A** *assigned a subject matter expert to drive knowledge transfer to the customer through learning workshops conducted at customers* explained the director of IT. **Company A** also employed a "*phased approach to transition the new technology into production*". They had to "*iteratively realign their internal customer's (user) expectations to reduce the customization of the system*". Conversely, **Company B** "*adjusted their internal platforms to meet the external customer needs*". Later in the project life-cycle, **Company B** "*conducted customer sponsored testing and implementations to gain the customer perspective on the required continuity parameters*". At the same time they "*involved their employees in the deployment of the project*", which helped them incrementally acquire the knowledge required for the support phases of the project [115].

5.2 Improving Learning Capability

"*User participation*" in IS provides valuable business knowledge [42]. The findings indicate that IT organization's learning capabilities were enhanced by acquiring and disseminate knowledge with the internal and external customer. The Director of IT **Company A** specified that "*the products that do require some customization warrant the involvement with the customer in the definition, testing and validation of these products and services*". A collaboration that enriched the individual skills of the participants (IT organization and customer). The degree of tacit-ness of newly acquired knowledge [116] necessitated richer organizational information processing mechanisms. The transfer of knowledge to internal customers at **Company A** (i.e. employees of the company) was accomplished through user training sessions. This helped **Company A** to "*overcome users' resistance to adopting the new BPM platform and eased the task on the IT organization*". Training sessions were carried in-house.

Meanwhile, **Company B** assigned technology champions to transition knowledge and encourage the dissemination of information among the team. "*As a result our ability to set SLAs with our customers and meet them is much improved*" specifies the General Manager. The project manager of **Company B** added explaining how they 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 issue*s". Users' manuals stored were in an online database. Extending outside the boundaries of the firm, "*training plans tailored for the customer empowered the IT organization to become more effective*" in supporting the customer base.

Company B included *knowledge management systems* in their toolset as part of their knowledge sharing strategy [117]. Knowledge management systems consolidated the acquired knowledge into an information base on internal and external customers.

"*The customer support team focuses on the customer. The infrastructure team plays the role of second level support. 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. Knowledge transfer tactics between the teams were applied*"; explicated the Customer Support Manager. These usually "*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*".

The IT organization used this convergence of information to participate in delivering the vision internally with an enthusiasm to contribute input. Such knowledge management and transfer capabilities [77] continue to build on the organizational knowledge [118] to improve the operational/functional competences of the IT organization [119] by combining the knowledge of the customer facing and the internal IT teams: "*Everyone participates in generating the strategy for the company. Customer support managers are intimate with customer issues and bring back customer success stories and share them with their IT internal counterparts*" said the IT infrastructure Manager at **Company B**. The IT director of **Company A** had a similar argument stating that "*the learning and the correlation of the effect of internal outages on the customer services and inversely, may serve as lessons learned for the potential impacts of internal IT changes on customer services*".

Thus, in both sites of the study, internal and external facing IT teams collaborated incessantly with their customers and among each other. Their accumulated experience increased the levels of knowledge [118]. This learning capability of experimentation [75], and the interaction with the external environment [120] were shown by research studies to positively associate with the introduction of novel product innovations in firms.

5.3 Bolstering Innovation Capability

As part of their approach to drive revenue from innovation integration, **Company B** sends their IT team scouts for opportunities at the customers' base. This gets the IT organization to gain an intimacy with the customers' strategy. They then collaborate with the customer's IT organization to define new product strategies and engage in the evaluation of new technologies: "*Our IT team scouts for opportunities at the customers' base and brings forth recommendations to drive more business out of the market share*". "*This has given us a way to earn the first seat at the table when our customers begin to consider their strategic plans*". *(Deputy GM/Operations Director B)*. This practice unlocks the prospect for some customers to push the

business to offer the services provided by a certain technology. The IT organization is then motivated to scan for emerging technologies and evaluate them. The opportunity to lead the host company's innovation strategy through this external exposure and collaboration enabled IT to bring forth recommendations to drive more business through the innovation of the products and service platform: "*Some of our customers impose technology changes on us, for example disaster recovery sites are being implemented to serve our customer requests even before our suppliers can drive this change in their ranks. So the customer is then pushing us and we push our suppliers*" *(General Manager—Company B).* Insight from the literature supports a form of co-creation [121] to exploit the tacit knowledge of the customer (Davis et al. 2009) into the delivery of the new services bringing forth a value proposition to the company internally and a greater competitive value [112].

6 Conclusion

"*User participation*" is not a novel notion in the context of IT integration. Nevertheless, the findings from this study extend related theory in suggesting mechanisms that emphasize the advantages of *user participation* in the context of IT organizational capability in IT services. Customers (internal & external) are included in the early stages of the deployment with an education process to convert the risk averse. Such collaboration would encourage the customer to accept the technology thus enhancing the exploitation capability of IT. Knowledge is acquired and disseminated through a network of internally and externally focused IT teams that transition the knowledge from the field to the operation and propagate it inversely. Knowledge management systems are deployed to manage customer issues while IT teams collaborate with customer to define new product strategies and consult with their customers in the evaluation of new technologies in a form of co-creation that is bound to add value.

On the other hand, IT services companies face a compound challenge of supporting the needs of internal and external customers [89]: (1) building and maintaining the IT infrastructure essential for their business and (2) designing and deploying IT applications and services for their customers. Issues of prioritization and risk are abound as an outage on an internal system could hinder the ability of the company to serve its internal and external customer, at the same time. This requires an ambidexterity in the IT organization that has maintain the uptime and SLAs of the services deployed for the internal and external customers via close communication with the support teams facing the external customer. Externally, IT organizations then strive to get closer and collaborate with their external customers as well. In spite of the advantages of value creation through customer learning, issues of costs, customer readiness, degree of involvement and skills challenge such collaboration. Yet, this practice unlocks the prospect for some customers of the business to drive the business strategy to offer the services provided by a certain technology.

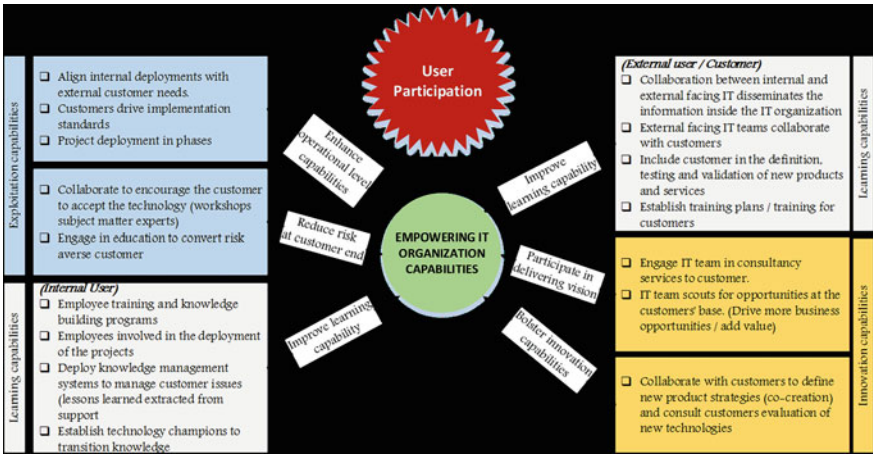

Fig. 1 Mechanisms of user participation to empower IT organizations capability

Thus, our study adds value to research as it treats a systemic issue in IT organizations of companies in the IT industry: 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). Presenting guidance through mechanisms that would empower IT organizations (Fig. 1), these findings may prove as lessons in practice for such organizations.

7 Limitations

Academics support the strengths of case study research "*as a comprehensive research strategy, specifically with regards to business research*" [122, p. 92]. Publications argue the extent of case study research generalizability [123, 124], though Tellis [125] affirms the inherent selectiveness of the case study research that focuses on one or two unexamined issues fundamental to understand the phenomena. Although the research has reached its aim, some unavoidable limitations can be noted. A potential limitation arises here in the setting of the centralized IT. Today's working practices are hybrid between telecommuting workforce, distributed or centralized. This may change the outcome in some of the concepts that require collaborative activities that may be hindered by differing types of organizations. Furthermore, IT links to culture and cultural contexts have been prevalent in the literature [126] affecting the organization's approach to collaboration, communication and risk management [127]. It is also important to note the inherent bias in the choice of the sites for the case study. The choice to focus on one industry, the IT services industry. Nevertheless, data from these paradigmatic [128] cases are

Table 4 Coded Concepts

IT exploitation capability	
Mechanisms	Empirical evidence
Align internal deployments with external customer needs—customers drive implementation standards (SLA)	Director of IT (A): "We had to iteratively align the implementation of the project to their expectations; often realigning their expectations to reduce the customization of the system". "This allowed our IT team to proceed with a better vision of the outcome and made sure that the changes on the system are controlled"
	Deputy GM/Operations Director (B): "The deployment of cloud technology allowed us to leverage our internal platforms and align it with our customer needs, and the benefits of an integrated technical solution based on automating the internal business process"
Project deployment in phases	Director of IT(A): "In order to keep the continuity of the services, the new technology must be transitioned into operation in a phased approach with a vigilant monitoring effort to maintain the services to our customers"
	Deputy GM/Operations Director (B): "We conducted customer sponsored testing and implementations to gain the customer perspective on the required continuity parameters, and involved their employees in the deployment of the project"
Engage in an education process to convert risk averse customer	General Manager (B): "With risk averse customers, we establish a collaborative exchange of knowledge and engage in an education process to help them get over the risky nature of the technology" […] "we performed joint assessment with the customer resources and map the risks directly to customer expectations"

(continued)

Table 4 (continued)

IT exploitation capability	
Mechanisms	Empirical evidence
Collaboration to encourage the customer to accept the technology (workshops subject matter experts)	IT Director (A): "We see a lot of reluctance in the IT teams of our customers. Our IT organization (especially in the latest project for a local bank), assigned a subject matter expert to conduct workshops at our customers and get them to understand the technology, get confident in it, then we were able to sell it to them. The IT team felt empowered to participate in the sale. That was a great team effort"
Collaboration between internal and external facing IT teams	Customer Support Manager (B): "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"
	Customer Support Manager (B): "The customer support team focuses on the customer. The infrastructure team plays the role of second level support. Knowledge transfer tactics between the teams were applied"
External facing IT teams collaborate with the customer	IT Infrastructure Manager (B): "Everyone participates in generating the strategy for the company. Customer support managers are intimate with customer issues and bring back customer success stories and share them with their IT internal counterparts"
Include the customer in the definition, testing and validation	Director of IT (A): "The products that do require some customization warrant the involvement with the customer in the definition, testing and validation of these products and services"
Establish training plans and perform training with the customer	Deputy GM/Operations Director (B):"Training plans (external and internal) for customer support makes them more effective"
Employee training and knowledge building programs	Deputy GM/Operations Director (B): "Extensive employee training and knowledge building programs were implemented"
	IT Support Manager (A): "To overcome the users' resistance to adopting the new BPM platform, we performed many user training sessions and developed easy to use users' manuals"
	Customer Support Manager (B): "We have setup a database of training materials that reduced costs of training and labs for the training activities to be carried in-house"…

(continued)

Table 4 (continued)

IT exploitation capability	
Mechanisms	Empirical evidence
Employees involved in the deployment of the projects	PMO (B): "Our employees are our internal customers; we involve them in the deployment of the projects in order to gain knowledge on adoption issues that might be applied to our external customers. We establish regular (biweekly) knowledge sharing session for the knowledge transfer"
Deploy knowledge management systems to manage customer issues	Director of IT (A): "The learning and the correlation of the effect of internal outages on the customer services and inversely, may serve as lessons learned for the potential impacts of internal IT changes on customer services"
	Customer Support Manager (B): "Most of our data collected from support calls are analyzed then disseminated among the remaining IT teams in a knowledge base in the form of lessons learned. 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"
Establish technology champions to transition knowledge	General Manager (B): "The champion usually leads working groups based on the projects at hand. This facilitates the transition of knowledge and encourage the dissemination of information among the team. This was very fruitful in the cloud project. Our ability to set SLAs with our customers and meet them is much improved"
IT team scouts for opportunities at the customers' base.	Deputy GM/Operations Director (B): "Our IT team scouts for opportunities at the customers' base and brings forth recommendation to drive more business out of the market share". "This has given us a way to earn the first seat at the table when our customers begin to consider their strategic plans"

(continued)

Table 4 (continued)

IT exploitation capability	
Mechanisms	Empirical evidence
Collaborate with customer to define new product strategies (co-creation) and consult customers evaluation of new technologies	Deputy GM/Operations Director (B): "Among our peers, we are distinguished by the fact that we know all our customers on a personal level even internationally. We have built 1:1 relationships with each one of them. Familiarity with cloud customers established a confidence for hosting services and opening the door for doing business"
	Deputy GM/Operations Director (B): "Our customers are consulted in our process of evaluating technologies and sometimes have a say in preferring one over another"
	General Manager (B): "Our customers bring to us concerns and drive our business strategy. We then go to the IT team and leverage the knowledge to build our services"
	General Manager (B): "This is a two way subject: (1) some of our customers impose technology changes on us, for example disaster recovery sites are being implemented to serve our customer requests even before our suppliers can drive this change in their ranks. So the customer is then pushing us and we push our suppliers"

suitable to support a conceptual insight on the scope of mechanisms that might enable the IT organization to successfully integrate innovation in collaboration with two customers, internal and external.

References

1. McKay, D.T., Brockway, D.W.: Building IT infrastructure for the 1990s. Stage by Stage **9** (3), 1–11 (1989)
2. Duncan, N.B.: Capturing flexibility of information technology infrastructure: a study of resource characteristics and their measure. J. Manag. Inf. Syst. **12**(2), 37–57 (1995)
3. Davenport, T., Linder, J.: Information management infrastructure: the new competitive weapon. In: Proceedings of the Twenty Seventh Hawaii International Conference on System Sciences. IV, pp. 885–896 (1994)
4. Weill, P.: The role and value of information technology infrastructure: some empirical observations. In: Banker, R., Kaufman, R., Mahood, M.A. (eds.) Strategic Information Technology Management: Perspectives on Organizational Growth and Competitive Advantage, pp. 547–572. Idea Group Publishing, Middleton, PA (1993)
5. Carlo, J.L., Lyytinen, K., Rose, G.M.: Internet computing as a disruptive information technology innovation: the role of strong order effects. Inf. Syst. J. **21**(1), 91–122 (2011)

6. Carlo, J., Lyytinen, K., Rose, G.M.: A knowledge-based model of radical Innovation in small software firms. MIS Q. **36**(3), 865–A10 (2012)
7. Fitzgerald, M.: Inside renault's digital factory. MIT Sloan Manag. Rev. 1–4 (2014)
8. Peppard, J., Ward, J.: Unlocking sustained business value from IT investments. Calif. Manag. Rev. **48**(1), 52–70 (2005)
9. Arduini, F., Morabito, V.: Business continuity and the banking industry. Commun. ACM **53** (3), 121–125 (2010)
10. Huff, S.L., Munro, M.C.: Information technology assessment and adoption. MIS Q. 327–340 (1985)
11. Swanson, E.B.: Information systems innovations among organizations. Manage. Sci. **40**(9), 1069–1092 (1994)
12. Agarwal, R., Prasad, J.: The role of innovation characteristics and perceived voluntariness in the acceptance of information technologies. Decis. Sci. **28**(3), 557–582 (1997)
13. Buyya, R., Shin Yeo, C., Venugopal, S., Broberg, J., Brandic, I.: Cloud computing and emerging it platforms: vision, hype, and reality for delivering computing as the 5th utility. Future Gen. Comput. Syst. **25**(6), 599–616 (2009)
14. Saleh, S.D., Wang, C.K.: The management of innovation: strategy, structure, and organizational climate. IEEE Trans. Eng. Manag. **40**, 13–21 (1993)
15. Bower, J.L., Christensen, C.M.: Disruptive technologies: catching the wave. Harvard Bus. Rev. (1995)
16. Bhattacherjee, A.: Management of emerging technologies: experiences and lessons learned at US West. Case Stud.: Inf. Manag. **33**(5), 263–272 (1998)
17. Davis, F.: Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q. **13**(3), 319–340 (1989)
18. O'Leary, D.E.: The impact of gartner's maturity curve, adoption curve, strategic technologies on information systems research, with applications to artificial intelligence, ERP, BPM, and RFID. J. Emerg. Technol. Account. American Accounting Association. 6 (2009)
19. Benamati, J., Lederer, A.L.: Managing the impact of rapid IT change. Inf. Resour. Manag. J. **23**(1), 1–16 (2010)
20. Leonard-Barton, D.: Implementation as mutual adaptation of technology and organization. Res. Policy **17**(5), 251–267 (1988)
21. Moore, G.C., Benbasat, I.: Development of an instrument to measure the perceptions of adopting an information technology innovation. Inf. Syst. Res. **2**(3), 192–222 (1991)
22. Bayer, J., Melone, N.: A critique of diffusion theory as a managerial framework for understanding adoption of software engineering innovations. J. Syst. Softw. **9**(2), 161–166 (1989)
23. Swanson, E.B., Ramiller, N.C.: The organizing vision in information systems innovation. Organ. Sci. **8**(5), 458–474 (1997)
24. Bunker, D., Kautz, K., Anhtuan, A.: An exploration of information systems adoption: tools and skills as cultural artefacts—the case of a management information system. J. Inf. Technol. **23**(2), 71–78 (2008)
25. Fichman, R.G., Kemerer, C.F.: The illusory diffusion of innovation: an examination of assimilation gaps. Inf. Syst. Res. **10**(3) (1999)
26. Cooper, R.B., Zmud, R.W.: Information technology implementation research: a technological diffusion approach. Manag. Sci. **36**(2), 123–139 (1990)
27. Johnston, A.C., Warkentin, M.: Fear appeals and information security behaviors: an empirical study. MIS Q. **34**(3), 549–566 (2010)
28. Devaraj, S., Kohli, R.: Information technology payoff in the health-care industry: a longitudinal study. J. Manag. Inf. Syst. **16**(4), 41–67 (2000)
29. Shin, N., Edington, B.H.: An integrative framework for contextual factors affecting information technology implementation. J. Inf. Technol. Theory Appl. **8**(4), 21–38 (2007)
30. Bernroider, E.W.N.: Effective ERP adoption processes: the role of project activators and resource investments. Eur. J. Inf. Syst. **22**(2), 235–250 (2013)

31. Uzkurt, C., Kumar, R., Kimzan, H.S., Eminoglu, G.: Role of innovation in the relationship between organizational culture and firm performance. Eur. J. Innov. Manage. **16**(1), 92–117 (2013)
32. Hasselbring, W.: Information system integration. Commun. ACM **43**(6), 33–38 (2000)
33. Gattiker, T.F., Goodhue, D.L.: What happens after ERP implementation: understanding the impact of inter-dependence and differentiation on plant-level outcomes. MIS Q. **29**(3), 559–585 (2005)
34. Legris, P., Collerette, P.: A roadmap for IT project implementation: integrating stakeholders and change management issues. Project Manag. J. **37**(5), 64–75 (2006)
35. Garcıa-Sanchez, N., Perez-Bernal, L.: Determination of critical success factors in implementing an ERP system: a field study in mexican enterprises. view from practice. Inf. Technol. Dev. **13** (3), 293–309 (2007)
36. King, W., Teo, T.S.H.: Integration between business planning and information systems planning: validating a stage hypothesis. Dec. Sci. **28**(2), 279–308 (1997)
37. Taylor, A., Helfat, C.E.: Organizational linkages for surviving technological change: complementary assets, middle management, and ambidexterity. Organ. Sci. **20**(4), 718–739 (2009)
38. Ghosh, S., Skibniewski, J.S.: Enterprise resource planning systems implementation as a complex project: a conceptual framework. J. Bus. Econ. Manage. **11**(4), 533–549 (2010)
39. Lawson-Body, A., Willoughby, L., Mukankusi, L., Logossah, K.: The critical success factors for public sector CRM implementations. J. Comput. Inf. Syst. **52**(2), 42–50 (2011)
40. Nazor, I., Fertalj, K., Kalpic, D.: Prediction model for characteristics of implementation of information systems in small and medium enterprises. Int. J. Innov. Manage. Technol. **3**(6), 740 (2012)
41. Dwivedi, Y.K., Wastell, D., Laumer, S., Henriksen, H.Z., Myers, M.D., Bunker, D., Srivastava, S.C.: Research on information systems failures and successes: status update and future directions. Inf. Syst. Frontiers **17**(1), 143–157 (2015)
42. Santa, R., Scavarda, A., Fang, Z., Skoko, H.: Managing the operational effectiveness in services using technological innovation. Int. J. e-Bus. Manag. **5**(1), 16–32 (2011)
43. Ives, B., Olson, M.H.: User involvement and MIS success: a review or research. Manag. Sci. **30**(5) (1984)
44. DeLone, W.H., McLean, E.R.: The DeLone and McLean model of information systems success: a ten-year update. J. Manag. Inf. Syst. **19**(4), 9–30 (2003)
45. Spears, J.L., Barki, H.: User participation in information systems security risk management. MIS Q. **34**(3), 503–A5 (2010)
46. Bradford, M., Florin, J.: Examining the role of innovation diffusion factors on the implementation success of enterprise resource planning systems. Int. J. Account. Inf. Syst. **4**(3), 205–222 (2003)
47. Lapointe, L., Rivard, S.: A multilevel model of resistance to information technology implementation. MIS Q. **29**(3), 461–491 (2005)
48. Markus, M.L.: Power, politics, and MIS implementation. Commun. ACM **26**(6), 430–444 (1983)
49. Joshi, K.A.: Model of users' perspective on change: the case of information systems technology implementation. MIS Q. **15**(2), 229–240 (1991)
50. Marakas, G.M., Hornik, S.: Passive resistance misuse: overt support and covert recalcitrance in is implementation. Eur. J. Inf. Syst. **5**(3), 208–220 (1996)
51. Martinko, M.J., Henry, J.W., Zmud, R.W.: An attributional explanation of individual resistance to the introduction of information technologies in the workplace. Behav. Inf. Technol. **15**(5), 313–330 (1996)
52. Armstrong, C.P., Sambamurthy, V.: Information technology assimilation in firms: the influence of senior leadership and IT infrastructures. Inf. Syst. Res. **10**(4), 304–327 (1999)
53. Khoo, H.M., Robey, D., Rao, S.V.: An exploratory study of the impacts of upgrading packaged software: a stakeholder perspective. J. Inf. Technol. **26**, 153–169 (2011)

54. Swanson, E.B.: The manager's guide to IT innovation waves. MIT Sloan Manag. Rev. 55–83 (2012)
55. Rai, A., Patnayakuni, R.A.: Structural model for case adoption behavior. J. Manag. Inf. Syst. **13**(2), 205–234 (1996)
56. Crum, M.R., Premkumar, G., Ramamurthy, K.: An assessment of motor carrier adoption, use, and satisfaction with EDI. Transp. J. **35**(4), 44–57 (1996)
57. Angst, C.M., Agarwal, R.: Adoption of electronic health records in the presence of privacy concerns: the elaboration likelihood model and individual persuasion. MIS Q. **33**(2), 339–370 (2009)
58. Kuo, T.: The antecedents of customer relationship in e-banking industry. J. Comput. Inf. Syst. **51**(3), 57–66 (2011)
59. Lee, J., Lee, D., Moon, J., Park, M.: Factors affecting the perceived usability of the mobile web portal services: comparing simplicity with consistency. Inf. Technol. Manag. **14**(1), 43–57 (2013)
60. Cash, J.I., Earl, M.J., Morison, R.: Teaming up to crack innovation and enterprise integration. Harvard Bus. Rev. **86**(11), 90–100 (2008)
61. Peppard, J., Edwards, C., Lambert, R.: Clarifying the ambiguous role of the CIO. MIS Q. Executive **10**(1), 31–44 (2011)
62. Barney, J.B.: Firm resources and sustained competitive advantage. J. Manag. **17**(1), 99–120 (1991)
63. Clark, C.E., Cavanaugh, N.C., Brown, C.V., Sambamurthy, V.V.: Building change-readiness capabilities in the IS organization: insights from the bell atlantic experience. MIS Q. **21**(4), 425–455 (1997)
64. Bhatt, G.D., Grover, V.: Types of information technology capabilities and their role in competitive advantage: an empirical study. J. Manag. Inf. Syst. **22**(2), 253–277 (2005)
65. Byrd, T.A., Turner, E.D.: An exploratory analysis of the information technology infrastructure flexibility construct. J. Manag. Inf. Syst. **17**(1), 167–208 (2000)
66. Bharadwaj, A.S.: A Resource-based perspective on information technology capability and firm performance: an empirical investigation. MIS Q. **24**(1) (2000)
67. Teo, T.S.H., King, W.R.: Integration between business planning and information systems planning: an evolutionary-contingency perspective. J. Manag. Inf. Syst. **14**(1), 185–214 (1997)
68. Grant, R.M.: The resource-based theory of competitive advantage: Implications for strategy formulation. Calif. Manag. Rev. **33**(3), 114–135 (1991)
69. Mata, F.J., Fuerst, W.L., Barney, J.B.: Information technology and sustained competitive advantage: a resource-based analysis. MIS Q. **19**(4), 487 (1995)
70. Gibson, C., Birkinshaw, J.: The antecedents, consequences, and mediating role of organizational ambidexterity. Acad. Manag. J. **47**(2), 209–226 (2004)
71. He, Z.L., Wong, P.K.: Exploration versus exploitation: an empirical test of the ambidexterity hypothesis. Organ. Sci. **15**, 481–494 (2004)
72. March, J.G.: Exploration and exploitation in organizational learning. Organ. Sci. **2**(1), 71–87 (1991)
73. Collis, D.J.: Research note: how valuable are organizational capabilities? Strateg. Manag. J. **15**, 143–152 (1994)
74. Broadbent, M., Weill, P., St. Clair, D.: The implications of information technology infrastructure for business process redesign. MIS Q. **23**(2), 159–182 (1999)
75. Cohen, W.M., Levinthal, D.: Absorptive capacity: a new perspective on learning and innovation. Adm. Sci. Q. **35**, 128–152 (1990)
76. Lawson, B., Samson, D.: Developing innovation capability in organizations: a dynamic capabilities approach. Int. J. Innov. Manag. **5**(3), 377–400 (2001)
77. Alavi, M., Leidner, D.: Review: knowledge management systems: conceptual foundation and research issues. MIS Q. **25**(1), 107–136 (2001)

78. Swanson, E.B., Ramiller, N.C.: Innovating mindfully with information technology. MIS Q. **28**(4), 553–583 (2004)
79. Abrahamson, E.: Managerial fads and fashions: the diffusion and rejection of innovations. Acad. Manag. Rev. **16**(3), 586–612 (1991)
80. Mumford, M.D., Licuanan, B.: Leading for innovation: conclusions, issues, and directions. Leadersh. Quart. **15**, 163–171 (2004)
81. Tidd, J., Bessant, J., Pavitt, K.: Managing Innovation: Integrating Technological, Market and Organisational Change, 3rd edn. (2005)
82. Crawford, J,. Leonard, L.N.K., Jones, K.: J. Inf. Syst. Technol. Manag.: JISTEM **10**(3), 483–502 (2013)
83. Eisenhardt, K.M.: Building theories from case study research. Acad. Manag. Rev. **14**(4), 532–550 (1989)
84. Eisenhardt, K.M., Graebner, M.E.: Theory Building from cases: opportunities and challenges. Acad. Manag. J. **50**(1), 25–32 (2007)
85. Goodhue, D.L., Thompson, R.L.: Task-technology fit and individual performance. MIS Q. **19**(2), 213–236 (1995)
86. Palaniswamy, R., Frank, T.G.: ORACLE ERP and network computing architecture: implementation and performance. Inf. Syst. Manag. **19**(2), 53 (2002)
87. Newman, M., Zhao, Y.: The process of enterprise resource planning implementation and business process re-engineering: tales from two chinese small and medium-sized enterprises. Inf. Syst. J. **18**(4), 405–426 (2008)
88. Van Der Zee, J.M., de Jong, B.: Alignment is not enough: integrating business and information technology management with the balanced business scorecard. J. Manage. Inf. Syst. **16**(2), 137–156 (1999)
89. Miozzo, M., Grimshaw, D.: Capabilities of large services outsourcing firms: the outsourcing plus staff transfer model in EDS and IBM. Ind. Corp. Change **20**(3), 909–940 (2011)
90. Chau, M., Xu, J.: Business intelligence in blogs: understanding consumer interactions and communities. MIS Q. **36**(4), 1189–1216 (2012)
91. Conforto, E., Amaral, D.: Evaluating an agile method for planning and controlling innovative projects. Project Manag. J. **41**(2), 73–80 (2010)
92. Keel, A.J., Orr, M.A., Hernandez, R.R., Patrocinio, E.A., Bouchard, J.: From a technology-oriented to a service-oriented approach to IT management. IBM Syst. J. **46**(3), 549–564 (2007)
93. Berthon, P., Hulbert, J.M., Pitt, L.F.: To serve or create? strategic orientations toward customers and innovation. Calif. Manag. Rev. **42**(1), 37–58 (1999)
94. Patton, M.Q.: Qualitative Evaluation and Research Methods, 2nd edn. Sage Publications, Newbury Park, CA (1990)
95. Damanpour, F.: Organizational innovation: a meta-analysis of effects of determinants and moderators. Acad. Manag. J. **3483**, 555–590 (1991)
96. Rogers, E.M.: Diffusion of Innovations. Free Press, New York (1962)
97. Miles, R.E., Snow, C.C., Miles, G.: The Future.org. Long Range Plan **33**(3), 300–321 (2000)
98. Kwon, T.H.A.: Diffusion of innovation approach to MIS infusion: conceptualization, methodology, and management strategies. In: Proceedings of the Tenth International Conference on Information Systems, pp. 139–146. Copenhagen, Denmark (1990)
99. Zmud, R.W.: Diffusion of modern software practices: influence of centralization and formalization. Manag. Sci. **28**(12), 1421–1431 (1982)
100. Fichman, R.G., Kemerer, C.F.: The assimilation of software process innovations: an organizational learning perspective. Manag. Sci. **43**(10), 1345–1363 (1997)
101. Grover, V., Goslar, M.D.: The initiation, adoption, and implementation of telecommunications technologies in U.S. organizations. J. Manag. Inf. Syst. **10**(1), 141–163 (1993)

102. Johansson, J., Malmström, M., Chroneer, D., Styven, M., Engström, A., Bergvall-Kåreborn, B.: Business models at work in the mobile service sector. I-Business **4**(1), 84–92 (2012)
103. Willcocks, L., Feeny, D., Olson, N.: Implementing core IS capabilities: Feeny-Willcocks IT governance and management framework revisited. Eur. Manag. J. **24**(1), 28–37 (2006)
104. Hargadon, A.B., Sutton, R.I.: Technology brokering and innovation in a product development firm. Adm. Sci. Q. **42**, 716–749 (1997)
105. Stewart, D.W., Shamdasani, P.N., Rook, D.W.: Focus Groups: Theory and Practice. Sage Publications, Thousand Oaks, CA (2007)
106. Lincoln, Y.S., Guba, E.G.: Naturalistic Inquiry, pp. 313–316. Sage, Newbury Park, CA (1985)
107. Creswell, J.W.: Qualitative Inquiry and Research Design: Choosing Among Five Traditions. Sage, Thousand Oaks, CA (1998)
108. Glaser, B.G., Strauss A.: The Discovery of Grounded Theory: Strategies for Qualitative Research. Chicago, IL: Aldine Publishing Co. The seminal work in grounded theory. (1967)
109. Maxwell, J.A.: Understanding and validity in qualitative research. Harvard Educ. Rev. **62**(3), 279–300 (1992)
110. Yin, R.K.: Case Study Research: Design and Methods, 4th edn. Sage, Newbury Park, CA (2009)
111. Miles, M., Huberman, A.M.: Qualitative Data Analysis: A Sourcebook of New Methods. Sage Publications, Newbury Park, CA (1991)
112. Strauss, A., Corbin, J.: Basics of Qualitative Research. Sage Publications, Newbury Park, CA (1990)
113. Allan, G.: A critique of using grounded theory as a research method. Electron. J. Bus. Res. Meth. **2**(1), 1–10 (2003)
114. Douglas, D.: Inductive theory generation: a grounded approach to business inquiry. Electron. J. Bus. Res. Meth. **2**(1), (2003)
115. Somers, T., Nelson, K.: The impact of critical success factors across the stages of enterprise resource planning implementations. In: Proceedings of the 34th Hawaii International Conference on System Sciences (2001)
116. Subramaniam, M., Venkatraman, N.: Determinants of transnational new product development capability: testing the influence of transferring and deploying tacit overseas knowledge. Strateg. Manag. J. **22**, 359–378 (2001)
117. McLaughlin, S.: Defining a process for developing responsive knowledge pathways. Knowl. Process Manag. **17**(4), 155–167 (2010)
118. Jansen, J.J., Van den Bosch, F.A.J., Volberda, H.W.: Managing potential and realized absorptive capacity: how do organizational antecedents matter? Acad. Manag. J. **48**(6), 999–1015 (2005)
119. Easterby-Smith, M., Prieto, I.M.: Dynamic capabilities and knowledge management: an integrative role for learning? Br. J. Manag. **19**(3), 235–249 (2008)
120. Varis, M., Littunen, H.: Types of innovation, sources of information and performance in entrepreneurial SMEs. Eur. J. Innov. Manag. **13**(2), 128–154 (2010)
121. Chesbrough, H.: Open Services Innovation: Rethinking your Business to Grow and Compete in a New Era, 1st edn. Published by Jossey-Bass (2011)
122. Zivkovic, J.: Strengths and weaknesses of business research methodologies: two disparate case studies. Bus. Stud. J. **4**(2), 91–99 (2012)
123. Stake, R.: The Art of Case Research. Sage Publications, Newbury Park, CA (1995)
124. Lee, A.S., Baskerville, R.L.: Conceptualizing generalizability: new contributions and a reply. MIS Q. **36**(3), 749–761 (2012)
125. Tellis, W.: Application of a case study methodology. Qual. Report, **3**(3) (1997)
126. Leidner, D.E., Kayworth, T.: Review: a review of culture in information systems research: toward a theory of information technology culture conflict. MIS Q. **30**(2), 357–399 (2006)

127. Martinsons, M.G., Davison, R., Martinsons, V.: How Culture influences IT-enabled organizational change and information systems. Commun. ACM **52**(4), 118–123 (2009)
128. Flyvbjerg, B.: Five misunderstandings about case-study research. In: Seale, C., Gobo, G., Gubrium, J.F., Silverman, D. (eds.) Qualitative Research Practice, pp. 420–434. Sage, London and Thousand Oaks, CA (2004)
129. Roberts, N., Grover, V.: Leveraging information technology infrastructure to facilitate a firm's customer agility and competitive activity: an empirical investigation. J. Manag. Inf. Syst. **28**(4), 231–270 (2012)