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Rethinking IT Sourcing and Supplier Management for the Digital Age

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Abstract: In the new era of digital transformation, the role of IT sourcing is becoming more strategic. A recent global outsourcing survey showed 53% of respondents outsource elements of their IT function and that continued growth in outsourcing is expected for the foreseeable future. Due to dependency on external partners, there is an increase in both the potential opportunities and the risks involved. Organizations can benefit from integrating third party capabilities, and accommodating 'outside in' innovation that leverages the considerable knowledge base of supply partners and creates synergies among other business ecosystem participants. Despite these opportunities, sourcing organizations have many challenges to contend with, such as sustainable supply chain governance, end-to-end traceability, legal and regulatory global compliance, data privacy, and tolerance for risk in service level agreements and contracts. New outsourcing models such as cloudsourcing, microsourcing, crowdsourcing, impact sourcing and rural sourcing have evolved, and many of these new models require behavioural and managerial type shifts. In order to address these challenges, organizations and their suppliers need strong complementary capabilities to build successful relationships. Both contractual and relational governance are important, and organizations additionally need to maintain a strategy of agility and adaptability in order to mitigate the lock-in and dependency risks associated with outsourcing.

This paper presents a review of pertinent literature, and discusses core learnings in relation to impacts on sourcing and supplier management in a digital business landscape. Based on an analysis of the literature and insights gained from engaging with industry and academic experts, the paper proposes a model that can be used to develop a capability to support effective sourcing and supplier management. This model provides a basis for further development in an industry/academia collaborative research project and aims to provide practical guidance to organizations in facing key challenges and optimizing the opportunities of IT sourcing and supplier management in the era of digital transformation.

Keywords: Capability, digital business strategy, digital transformation, IT-CMF, IT sourcing, sourcing and supplier management, sourcing model.

1. Introduction

Digital transformation is defined as "the use of new digital technologies (social media, mobile, analytics or embedded devices) to enable major business improvements (such as enhancing customer experience, streamlining operations or creating new business models)". It is regarded as being increasingly critical to the organization's competitiveness, and a core enabler to how it operates and evolves (Fitzgerald et al., 2013). It requires that organizations adapt their business models and business processes, rethink strategy, and collaborate with the business ecosystem to provide more innovative products and services. Organization's executives see the potential for using digital technologies to open routes to new ways of doing business but are unclear on how to get the results and look for guidance on the best means to achieve transformation in their particular areas of responsibility. This has impact across many IT management activities, one being the important function of sourcing and supplier management.

One approach to address digital transformation is to develop and mature the sourcing and supplier management capability in the organization. An organizational capability is defined as "the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result." (Helfat and Peteraf, 2003, p.999). Development of an IT capability is needed in order to leverage greater value from IT investments in the organization (Peppard and Ward, 2004). Leveraging an organization's capability is particularly relevant to digital business strategy, as in order to remain competitive, organizations need to continually re-configure the capabilities they have developed over time (Zahra et al., 2006). This paper takes a

capability perspective in reviewing digital transformation developments and the responses needed for effective sourcing and supplier management.
The research aims of this paper are:

- To examine the key facets of sourcing and supplier management and identify how these are being impacted by the digital business landscape.
- Determine both the challenges that need to be addressed and the opportunities that can be exploited.
- Conceptualize the key insights uncovered, in a model that can be used to guide sourcing and supplier management capability improvement by practitioners, to address digital transformation developments.

The structure of this paper is as follows: Section 1 has introduced the IT sourcing and supplier management research focus. The literature review in section 2 looks at current literature around how the nature of IT sourcing and supplier management is dramatically transforming due to digitization and provides contextual background to pertinent challenges and opportunities emerging from the digital business landscape. Section 3 outlines the methodological approach adopted. Section 4 presents the conceptual model, while section 5 presents discussions, conclusions, and avenues of future research.

2. Literature review

Since Lacity and Willcocks began researching the relatively new activity of IT outsourcing in the 1990's, organizations have sought insights on the best sourcing approach to give them a competitive advantage (Lacity and Willcocks, 1998). In the new digital business era, this is more complex due to the increase in both the potential opportunities and the risks involved (Overby, 2015). Dependency on external partners has increased, and this, combined with the growing impact of disruptive technologies, has resulted in sourcing becoming more strategic; prompting re-thinking of a CEO's involvement/role in sourcing activities (Willcocks and Lacity, 2012). Continued growth in outsourcing is expected for the foreseeable future. Deloitte's 2014 global outsourcing survey, for example, showed 53% of respondents outsource elements of their IT function (Deloitte, 2014).

While traditionally the main reason to outsource was cost savings, in the new digital era it is more driven by a search for talent, to close digital skills gaps, or to acquire new digital services or development capabilities (Da Rold and Karamouzis, 2014; Sousa, 2014; Lu et al., 2015). New outsourcing models, such as cloudsourcing, microsourcing, crowdsourcing, impact sourcing and rural sourcing have evolved, to add to the existing onshore, nearshore, or farshore; and single or multiple supplier options (Da Rold and Karamouzis, 2014; Daub and Wiesinger, 2015; Lu et al., 2015; Schlagwein and Bjørn-Andersen, 2014; Willcocks and Lacity, 2012; Whitten, 2010; Lacity et al., 2010; Boström, 2015; Muhic and Johansson, 2014; Solli-Sæther and Gottschalk, 2015; Ågerfalk et al., 2015). While outsourcing is still the dominant approach, insourcing continues and there is an emergence of backsourcing due mainly to socio-political drivers, e.g. unemployment and the 'green agenda'. These new models are explained as follows:

- Cloudsourcing - outsourcing to the Cloud might be the most significant growth factor in the historical development of outsourcing (Muhic and Johansson, 2014). Over 69% of 2014 outsourcing survey respondents indicated that developments in cloud services would increase their outsourcing (Deloitte, 2014).
- Microsourcing - the hiring of skilled workers for specialized tasks either for a limited or part time basis (Aris et al., 2013). The use of online microsourcing platforms is gradually becoming mainstream (Lu et al., 2015). Offshore microsourcing additionally employs new practices of middlemen and special interfaces (Willcocks and Lacity, 2012).
- Crowdsourcing - a means of directly sourcing individuals to do a specified piece of work, usually via the Internet. Wikipedia is one well-known example of crowdsourcing (Grier, 2013).
- Impact sourcing – the practice of training and hiring marginalized or otherwise disadvantaged individuals to provide information technology (IT), business process, or other digitally enabled services (Lacity et al., 2014).
- Rural sourcing - the practice of hiring from rural communities for information technology (IT), or other digitally enabled services, often accessing these individuals through subcontractors (Willcocks and Lacity, 2012).
- Backsourcing - taking back previously outsourced work. In addition to the above mentioned socio-political drivers the decision to backsource can also be based on a combination of excessive costs, poor

service, loss of control, know-how mismatch, appointments of new executives, IS role changes, and external business changes (Solli-Sæther and Gottschalk, 2015).

In the digital context, there is more demand for innovation and transformation through outsourcing supplier engagements (Willcocks and Lacity, 2012). An important incentive for organizations to engage with emerging forms of sourcing is a perceived potential for innovation, by innovating product development, products and services. Organizations seek both incremental and radical innovations. They look for benefits from transformative innovations which improve business through various contractual arrangements that incentivize the supplier to innovate for the organization (Oshri et al., 2015). It is through the make-or-buy-or-cooperate decisions that the organization is able to change its nature and scope, and adapt to an ever-changing business environment (Sousa, 2014). However, it must also be borne in mind that completing knowledge-intensive tasks will become challenging if most of the knowledge exists outside an organization (Ågerfalk et al., 2015).

Supplier contracts become more complex in the digital context, with additional factors to address. For instance, customers today are concerned with sustainable supply chain governance, end-to-end traceability, and global compliance challenges of sourcing and supplier management (Boström, 2015). Political Corporate Social Responsibility (CSR), based on the assumptions of business's extended responsibilities and roles in a globalized context, is another sourcing contract consideration (Rotter et al., 2014). Green procurement and supplier development are growing trends to be acknowledged (Blome et al., 2014). The green agenda, political risk, and customer perceptions can create pressure points in offshore sourcing to ensure it is sustainable (Willcocks and Lacity, 2012). It is becoming more common to have a larger number of smaller suppliers. The average contract size and duration is getting smaller with higher transaction and management costs due to more bidding excess fees and extras, hidden costs, and inflexible contracts that are not adaptable to change. New practices are emerging to counter these such as flexible pricing, competitive bidding beyond the baseline contract, and a "long-term relationships with short-term contracts" approach (Willcocks and Lacity, 2012).

The outsourcing landscape is constantly changing, so retaining the flexibility to change direction rapidly is key, and building a strategic supplier management and governance capability is necessary to achieve this (Deloitte, 2014). Choosing the appropriate sourcing model is critical. Multisourcing - blended sourcing alternatives that astutely mix outsourcing and insourcing to integrate complementary strengths of different organizations - is the recommended approach for the dynamic, complex and hybrid future of sourcing (Willcocks and Lacity, 2012); (Singh, 2015). Deloitte say that organizations will seek to leverage multi-supplier strategies requiring transition and service integration capabilities (Deloitte, 2014). Outsourcing contracts must evolve in order to create value and mitigate risk for the IT-outsourcing organization. Sourcing models must address both risk *and* benefit. Cybersecurity and data privacy are some of the key concerns (Overby, 2015). The critical issues cited when esourcing are; relationships, workforce, threat management, service delivery, continual improvement, service transfer and managing the sourcing itself (Hefley and Loesche, 2010).

Many new sourcing models require behavioural and managerial type shifts. For example, cloud sourcing requires a shift in attitudes, behaviours, and capabilities and project management of the transition. A time-boxed approach (i.e. allocating a fixed time period - *a time box* - to each planned activity) is recommended in this context, since time discipline reduces the risks. While Cloud changes the risk profile it also offers innovation opportunities. When cloudsourcing it is crucial to understand and ensure that data privacy, security regulations, compliance, standards, tolerance for risk, governance and service level agreements are all addressed. Challenges quoted here are legal and regulatory compliance, contracts lock-in, dependency, and flexibility (Willcocks and Lacity, 2012).

Relationships matter - despite our greater reliance on technology the single best performance improver in a Business Process Outsourcing (BPO) study by Lacity and Willcocks was "to assign a great pair of leaders, one from the client and one from the provider". This and other practices such as trust building steps, and modes of operation that support collaboration and openness promote innovation through outsourcing (Lacity and Willcocks, 2014). Sometimes having the external perspectives alone can result in innovation. In an earlier study they concluded that adaptive work – which requires versatility and learning in the workforce – using multifunctional teams, leadership and multiple stakeholder involvement and learning is vital for innovation (Willcocks and Lacity, 2012). McKinsey suggest establishing rapid decision-making and escalation processes to match the digital way of working (Daub and Wiesinger, 2015).

As traditional supply chains give way to supply ecosystems, organizations need to adapt their strategic sourcing to this evolution. In this arrangement each member must create value for itself, but not at the expense of the ecosystem (Ketchen et al., 2014). In the Business-to-Business (B2B) world co-evolution of capabilities and business specialisms are developed (Sousa, 2014). Different types of IT outsourcing relationships and supplier governance structures are appropriate for the specific management of each outsourcing client type based on their underlying expectations (Leimeister, 2010). Both contractual and relational governance are important, clients and suppliers need strong complementary capabilities to make relationships successful (Lacity et al., 2010). New modes of openness and collaboration are evolving such as coopetitiveness; where normally competing actors gain mutual benefits by co-operating in certain activities (Ågerfalk et al., 2015).

Organizations need to maintain a strategy of adaptability in order to mitigate the risks associated with suppliers. Data security and the quality of resources of the supplier seem to be the risks with the highest priority as perceived by organizations. The supplier risk profile must be balanced relative to other risks taken by the organization (Willcocks and Lacity, 2012). A major influence on the adaptability of a firm in the short- and long-term is the supplier switching costs (Whitten, 2010). Organizations also need to assess their attitude toward sharing critical knowledge with suppliers (Daub and Wiesinger, 2015). As a result, data privacy regulation is becoming a negative driver for outsourcing (Deloitte, 2014). Organizations will need to explore new sourcing contract mechanisms, such as risk-sharing agreements and innovative pricing schemes that reward experimentation and collaboration to optimize the supplier relationship (Daub and Wiesinger, 2015).

3. Methodology

This paper seeks to develop a conceptual model for managing IT sourcing and supplier impacts in the digital business context. The conceptual model is based on a capability maturity framework of 36 IT-related critical capabilities (Figure 1) developed by the Innovation Value Institute (IVI) research consortium (Curley et al., 2015) using a design science approach (Curley et al., 2012; Hevner et al., 2004). IT-CMF helps organizations to measure, develop, and monitor their maturity progression of these IT capabilities, which are “a defined IT management domain that helps mobilize and deploy IT-based resources to effect a desired end, often in combination with other resources and capabilities.” (Curley et al., 2015, p.583), for maximum business benefit. The conceptual model developed here is informed by two of these identified critical capabilities (CCs) – *Sourcing* and *Supplier Management* - and by the learnings taken from the above literature review, with the aim of putting forward an updated critical capability, combining these two CCs, to address the digital business context. IVI is currently in the process of updating the IT-CMF body of knowledge to increase its relevance to the evolving digital transformation environment. The conceptual model put forward in this paper will form the basis for the revised Sourcing and Supplier Management capability, which will be developed using a design science (DS) approach.

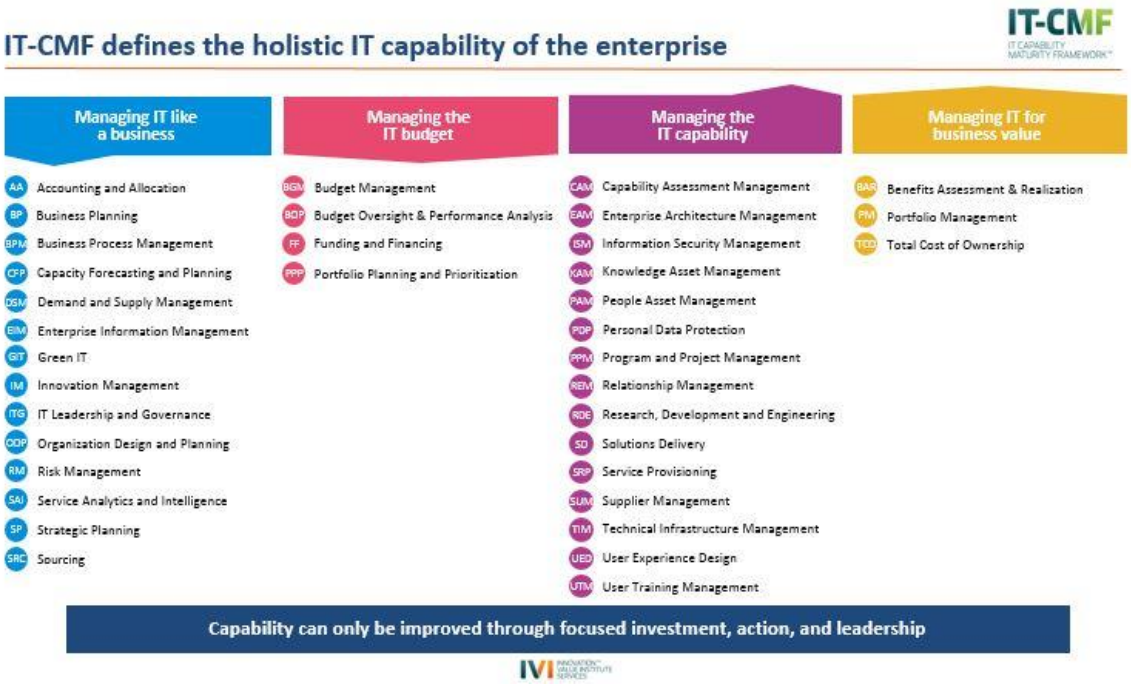

Figure 1 The IT Capability Maturity Framework™ (IT-CMF™) 36 critical capabilities

In undertaking the previously discussed literature review, the authors sought to identify and analyse the key themes in the stream of research relating to sourcing and supplier management in the digital context. A focused literature search was undertaken to identify the key themes and their frequency.

The following terms were searched for within the title, abstract, or keywords of the paper: 'digital business' AND 'sourcing', 'digital business' AND 'supplier management', 'digital' AND 'IT sourcing', 'digital' AND 'IT supplier management'. The literature sources were Scopus, Web of Science, and the Business Source Complete databases with articles published between 2010 and 2016 inclusive. In total, the authors identified 65 papers. Additionally, a search of practitioner publications from Accenture, Gartner, Deloitte, McKinsey, Capgemini, and Oracle was also undertaken, which returned 19 articles. Following an initial screen of the title, abstract, and keywords, in which the authors eliminated those papers with language issues, poor quality, or addressing topics that were deemed as peripheral to the core focus area, 25 papers and eight practitioner articles in total were considered to address the research questions.

The learnings from the review of literature related to the impacts to sourcing and supplier management arising from the digital business were compiled. A content analysis of the material extracted from the literature was undertaken by converting the themes identified into a 'concept-centric' format to establish the most common concepts. The authors created a high-level categorization, according to which the key themes were classified (Table 1). The authors followed the concept matrix method (Webster and Watson, 2002) - the matrix rows provide the paper references from which the concepts were extracted, while the frequency of occurrence of a particular theme is indicated by the number of 'Xs' in the table columns.

Table 1 Sourcing and Supplier Management Digital Impact Concepts in extant Literature

Articles	*Sourcing and Supplier Management Digital Impact Concepts*							
	New sourcing models & supply ecosystem	**Sourcing is more strategic - Partnerships & innovation**	**Digital talent, skills, competencies & capabilities**	**'Outside in' innovation**	**Corporate Social Responsibility/ Customer focus**	**Relationships matter/ Integration & accountability are critical**	**Think like a start-up - Agile techniques & flexible contracts**	**Increased supplier risk security & continuity of supply**
Ågerfalk et al., 2015		X		X				
Aris et al., 2013		X	X					
Arrigo, 2012				X				
Blome et al., 2014					X			
Boström, 2015	X	X	X		X	X		X
Chen, 2013	X							

Da Rold and Karamouzis, 2014	X		X	X		X	X	
Daub and Wiesinger, 2015	X		X				X	X
Deloitte, 2014	X		X	X				
Flinders, 2015	X						X	
Hassan, 2015			X				X	
Herbert, 2013				X				
Ketchen et al., 2014					X			
Kumar et al., 2014	X			X		X		
Lacity et al., 2010		X						
Lacity and Willcocks, 2014				X		X		
Lacity et al., 2014	X				X			
Leimeister, 2010	X	X				X		
Lu et al., 2015				X				
Muhic,2014	X		X					X
Nagpal, 2015	X							
Oshri and Kotlarsky, 2010	X	X						
Oshri et al., 2015			X	X		X	X	
Overby, 2015								X
Rotter et al., 2014					X			
Schlagwein and Bjørn-Andersen 2014	X					X		
Articles	*Sourcing and Supplier Management Digital Impact Concepts*							
	New sourcing models & supply ecosystem	**Sourcing is more strategic - Partnerships & innovation**	**Digital talent, skills, competencies & capabilities**	**'Outside in' innovation**	**Corporate Social Responsibility/ Customer focus**	**Relationships matter/ Integration & accountability are critical**	**Think like a start-up - Agile techniques & flexible contracts**	**Increased supplier risk security & continuity of supply**
Schlagwein et al., 2014	X		X					X
Singh, 2015	X							
Solli-Sæther and Gottschalk, 2015		X						
Sousa, 2014				X				
Whitten, 2010	X						X	
Willcocks and Lacity, 2012			X	X				X
Yoo et al., 2011		X	X					
Totals	15	8	11	11	5	7	6	6

Table 1 highlights the key digital impacts noted in the literature that should be considered and plans made to address them in order to remain competitive in IT sourcing and supplier management.

4. Conceptual model

A basic capability for sourcing and supplier management is required as a 'backbone' before the challenges of the digital business context can be addressed and opportunities arising exploited. This 'backbone' is represented by the four elements of 'Sourcing Strategy', 'Supplier Contracting and Classification', 'Supplier Integration and Engagement' and 'Supplier Operations Management' as depicted in figure 2. The composition of these elements is not discussed in this paper; it is the impacts to these four capability elements resulting from the digital business context that are under scrutiny here.

Based on the above concept matrix and insights gained from engaging with industry and academic thought leaders, figure 2 below has been developed to conceptualize a model that can be used to develop a capability that will support effective sourcing and supplier management in a digital business context.

The model depicts the capability elements of sourcing and supplier management and identifies impacts arising from digital business transformation on:

1. Sourcing Strategy
2. Supplier Contracting and Classification
3. Supplier Integration and Engagement
4. Supplier Operations Management

Topics and approaches needing consideration in a digital business context are listed against each of these four elements. While the challenges and opportunities outlined earlier in the paper are included in the conceptual model, there is not a 1-to-1 relationship between these and the topics listed against the four elements. The model represents a top-level view with some challenges grouped for simplicity. Additionally many of these topics affect more than one element, for simplicity, these are positioned according to the area of highest impact. The conceptual model in figure 2 outlines that for effective sourcing and supplier management in the digital context, organizations need to:

- Establish a sourcing strategy that is aligned with the more strategic role played by sourcing in the digital context, which reflects key issues such as the evolution and applicability of different sourcing models, and the viability of sourcing as an option to address in-house skill gaps and to co-innovate through partnership-type relationships with a network of sourcing partners.
- Establish effective criteria for classifying suppliers and an approach to addressing the growing complexity of sourcing contracts, reflective of issues such as corporate social responsibility and building agility and flexibility into the contract process.
- Integrate and engage with suppliers to foster mutually beneficial and enduring relationships that are built on the foundations of openness, trust, and accountability.
- Manage ongoing supplier operations, cognisant of security and continuity of supply risks and the institutionalization of a process of 'outside in' innovation that results through a culture of collaborate work with supply partners.

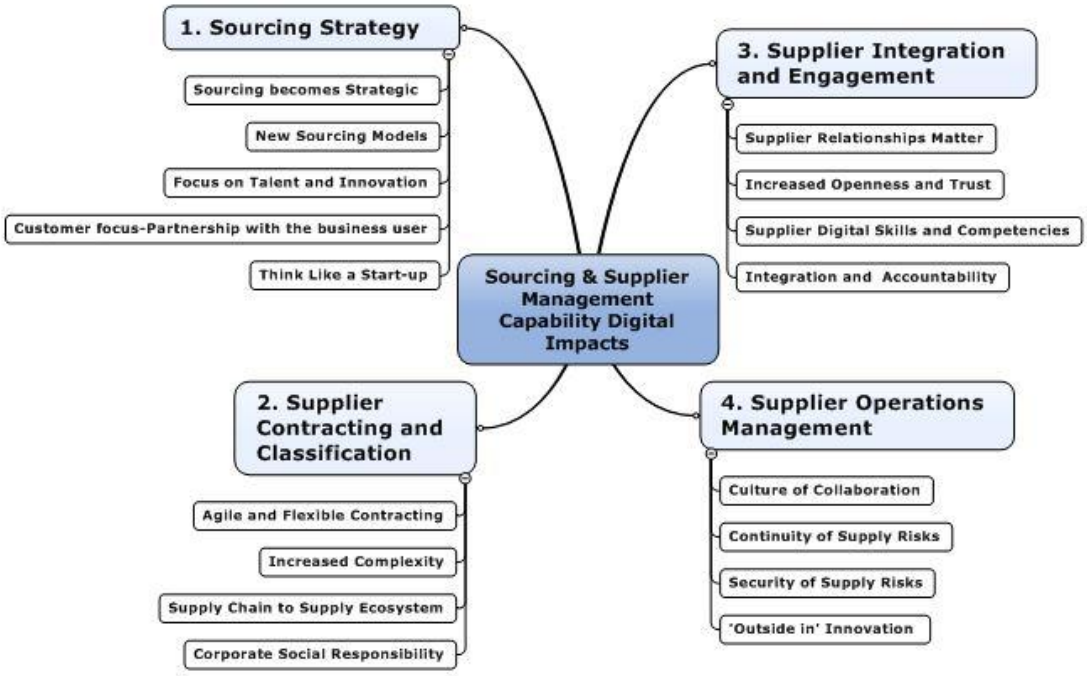

Figure 2 Sourcing & Supplier Management Capability Digital Impacts Conceptual Model

The development of a capability around these core topics enables an organization to be more effective in establishing responses to the challenge of sourcing and supplier management in the digital context, as illustrated by the example typical challenges and responses outlined in Table 2 below.

Table 2 Example challenges and responses to sourcing and supplier management digital impacts

Challenge	*Response*
Speed of change in customer needs	Long-term relationships with short-term contracts
Lack of internal talent/experience in SMACIT (Social, Mobile, Analytics, Cloud & Internet of Things)	Contract in expertise as required using e.g. microcontracts
Continual change needed to keep pace with the business environment	Co-innovation with supplier chain/ecosystem Development of an ecosystem
Corporate social responsibility reputation	Traceability across the supply chain/ecosystem

A key contribution of this conceptual model is in offering organizations an overarching view of the key issues they need to consider. As such, the model serves as a foundation for organizations to establish a comprehensive sourcing and supplier management approach for the digital environment. This model provides a basis for further development in an industry/academia collaborative research project and aims to provide practical guidance to organizations on key challenges of IT sourcing and supplier management.

5. Discussion and conclusions

In the continually evolving world of digital transformation, IT management face a constant challenge in enabling the digital business strategy and thereby organizational competitiveness. In the area of sourcing and supplier management, digital transformation presents both challenges to face and opportunities to exploit. The organization needs to develop the capability to define an appropriate sourcing strategy, manage the selection and integration of IT suppliers, and ensure the delivery of innovation and business value while ensuring the digital impact considerations highlighted in figure 2 have been addressed, as appropriate in their own business context. As previously stated the conceptual model developed is based on the premise that in order to effectively address sourcing and supplier management, organizations need to establish an effective capability to overcome the challenges and risks of digital transformation, while simultaneously seizing the digital opportunities made possible through collaborative and innovative activities with supply chain partners.

Previous studies have focussed on how elements of either sourcing (Flinders, 2015; Ågerfalk et al., 2015; Deloitte, 2014; Willcocks and Lacity, 2012) or supplier management (Singh, 2015; Daub and Wiesinger, 2015; Boström, 2015) are evolving in response to digitization. Additionally, other studies have looked at developing management capabilities to gain competitive advantage for the organization (Hefley and Loesche, 2010; Peppard and Ward, 2004; Helfat and Peteraf, 2003). In this study, the authors advance this research by conceptualizing a capability model to develop sourcing and supplier management in a digital business context.

While this model is based on a review of pertinent digital literature (academic journal articles and practitioner journal articles and reports), and is based on the analysis of this literature combined with the insights of subject matter experts, the resultant model is not validated by primary research in this paper. However, it is recommended as a good resource for practitioners in addressing digital business impacts on their sourcing and supplier management activities. Further research through collaboration with industry practitioners and academic researchers using a design science approach is planned, to validate the components of the conceptual model identified.

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