Service-Oriented Architecture as a driver of Service Innovation in newly emerging Service Systems: An exploratory view

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Abstract

Innovation in services can be regarded as an inter-play of service concepts, service delivery practices, client interfaces, and service delivery technologies. Furthermore, innovations in services are increasingly brought to the market by networks of firms, selected for their unique capabilities and operated in a coordinated manner, referred to as a service system or service value network (SVN). Bringing such service innovations to market by a network of firms requires extensive coordination and integration of data, information/knowledge and processes, while ensuring strategic alignment of partnering firms. In this research we examine how Service-Oriented Architecture (SOA), and its effect on Information Technology Infrastructure Flexibility (ITIF), may act as a potential enabler for recently identified organizational drivers of services innovation in a service system, namely Collaborative Architecture Management (CAM) and Collaborative Organizational Infrastructure (COI). A preliminary qualitative study of a Telco and its partners in the Middle East validates the dynamic capabilities at play in our proposed research model.

Keywords*: SOA, services innovation, service system, dynamic capabilities*

1. Introduction

In today's competitive environment, changes are taking place much faster than before [1],[2] as firms face intense rivalry, globalization, and time-to-market pressures [3],[4]. Securing a competitive advantage therefore does no longer rely on efficiency, quality, and customer responsiveness alone. While each of these factors is important, the requirement and ability to innovate, often with speed and value-added attributes, takes center stage. This makes innovation, flexibility, coordination, integration, and speed the new success factors of today's service value networks (SVN) [5]. Examples of services innovation operating in a SVN context include real estate portals, online universities, entertainment media tourism, interactive advertising, among others [6]. The development and delivery of new and elevated service offerings is contingent on the organizations' ability to anticipate and respond spontaneously to the changing needs of the market [7]. Information technology (IT) has been shown to play a critical role in enabling organizations to develop and deliver new and elevated service offerings [7],[8],[9], [10]. Furthermore, recent studies have identified two key organizational drivers for services innovation, defined as Elevated Service Offering (ESO) [3],[5], in a service system—Collaborative Architecture Management (CAM), reflecting coordination and alignment; and Collaborative Organizational Infrastructure (COI) that addresses the needs of integration [11]. Yet, the question on the technological options that are most appropriate to enable these organizational drivers, still remains to be answered.

Recently, Service Oriented Architecture (SOA) has been proposed as a mechanism to facilitate alignment of IT with business requirements that are changing at an ever increasing rate, because of its ability to engender a higher level of IT infrastructure flexibility (ITIF) [12]. It has been suggested that

SOA can be used as an approach for building systems that enhance IT's ability to efficiently and effectively react to the fast-changing business environment and, in turn, enable organizations to respond to these changes in a timely manner [13],[14]. While the literature shows evidence of an association between SOA and ITIF, the potential role of ITIF within COI and CAM needs to be further examined empirically to investigate the linkage between SOA and eventual services innovation. This study will investigate such missing links by investigating how SOA infusion may work through COI and ITIF in enhancing CAM, leading eventually to services innovation or ESO. As such, the role of SOA as a technological option for enabling important drivers of services innovation in a service system will be firmly established. Next, we introduce the fundamental domains underlying the research question: SOA, ITIF, COI, CAM, and services innovation defined as Elevated Service Offering (ESO) [3],[6].

2. Literature review

2.1 Service oriented architecture (SOA)

SOA represents a core technology in the increasingly important discipline of service science. This research employs the definition provided by [15], which adopts the view that—SOA is the architectural style that supports loosely coupled services to enable business flexibility in an interoperable, technology-agnostic manner. SOA consists of a composite set of business-aligned services that support a flexible and dynamically re-configurable end-to-end business processes realization using interface-based service descriptions. Implicit in this definition is the objective of employing SOA to enhance Information Services (IS) and business agility [4], and to improve IT-business alignment in a rapidly changing business environment, cited to be crucial and yet extremely difficult to realize [16],[17],[18]. As such, those able to successfully implement SOA are able to realize greater IT infrastructure flexibility. Based on the proven association between SOA and ITIF, our research extends the important role of SOA by investigating its potential association with services innovation through enhanced COI and CAM.

2.2 IT infrastructure

The literature suggests that IT infrastructure is the enabling foundation of shared IT capabilities and components upon which the entire business depends [19],[20],[21] and as a key source for attaining long-term competitive advantage. Overall, IT infrastructure is viewed as the shared fundamental resources that need to exist to attain competitive advantage, and is to be treated as a critical business capability, as well as a foundation of IT capability. IT infrastructure consists of both technical and human infrastructural components [20],[22]. However, it is often the technical IT infrastructure that is referred to when practitioners discuss IT infrastructure [23]. In this study, we also focus on the technical aspects of IT infrastructure.

2.3 IT infrastructure flexibility (ITIF)

IT Infrastructure Flexibility (ITIF) can be viewed as an organizational core competency [24],[21]. Some of the key dimensions of ITIF were proposed by [19]. Ref.[23] adapted Ref.[19]'s dimensions to further develop and propose three key constructs of ITIF – connectivity, compatibility, and modularity. Connectivity is the ability of any technology component to attach to any of the other technology components inside and outside the organizational environment. Compatibility refers to the ability to share any type of information across any technological components. Modularity addresses the ability to add, modify, and remove any software, hardware, or data components with ease and with no major overall effect. Our research will use Ref.[23]'s three dimensions of IT infrastructure flexibility.

2.4 Collaborative organizational infrastructure (COI) and Collaborative architecture management (CAM)

In SVN, decisions about technology deployment, IT systems integration and better integration of processes on an end-to end basis can significantly impact organizational benefits. As such, technology adoptions, information sharing through systems, and process integration across partners of SVN are all essential criteria for success of SVN. COI is identified as a construct that allows for information and knowledge sharing through the integration of systems and processes both within and across organizational boundaries of SVN [11], facilitating the building of a sustainable service system that delivers services innovation. CAM, another organizational driver for successful services innovation, is defined ―as an ability to coordinate and align resources, activities and routines that span across inter- and intra- organizations, with mutually agreed cost, revenue and risk sharing performance measures that are to the benefit all parties of SVN‖ [11],p.39. IT has the potential to act as a catalyst to promote and enhance the ability to collaboratively work with speed and flexibility.

2.5 Services innovation and elevated service offering (ESO)

Services innovation refers to a process of offering new services not previously available to the firm's customers [25]. In collaborative networks, however, ESO, a unique form of services innovation, is needed. ESO is defined as a new or enhanced service offering that can only eventuate as a result of a collaborative arrangement [3]. The service offering is "elevated" beyond what is possible by the individual firm through collaborative efforts and/or expertise of its network partners. Service innovation results when a firm is able to focus its entire energies to think on behalf of the customer for an outcome that surpasses customers' present expectation of superior value [26]p.24. In our context of network partners, previous alliance literature and innovation literature have demonstrated that innovation in services is possible in several dimensions through increased productivity, improvement in performance, and new service offerings [3],[8],[27],[28],[26],[29],[30],[31].

3. Theoretical underpinnings and hypotheses

In this section, theoretical arguments for the research hypotheses are grounded based on extant literature on SOA, Resource Based View (RBV), the theory of dynamic capabilities, and service innovation. Following RBV and the theory of dynamic capabilities, we point out that the core value of IT infrastructure in SVN lies, in fact, on IT's capability of continued suitable blending, which can be realized through IT infrastructure flexibility. Next, our research postulates that the capability of continued suitable blending leads to better CAM with the help of enhanced COI through SOA infusion. Finally, the association between CAM and ESO is proposed.

3.1 SOA and systems integration

Previous studies suggest that SOA represents a technology paradigm to tackle the massive integration challenges occurring in alliances, mergers, and acquisitions, among many others [13]. Its core strengths lie in its ability to enhance proper integration, while promoting flexibility [32]. In addition to its ability to streamline internal business operations by providing an overlay that can allow disparate systems to communicate, it also enables more flexible integration with partners and offers organizations the ability to share applications and information that enhance the reach and richness of organizational integration [33],[34],[58]. Both CAM and COI have been found as important organizational drivers for building a sustainable SVN [11]. CAM and COI encapsulate coordination, alignment and integration dimensions that integrate the design and underlying logistics of the SVN. Whereas CAM addresses coordination, conflict management, complementarity and compatibility, protection of assets, and collaborative alignment, COI addresses integrated systems and processes and integrated information sharing. Ref[11] found that partner alignment, partner coordination, and partner integration emerged as the predominant underlying factors of CAM and COI. Hence, SOA exhibits all the predominant features for enabling flexible integration with partners, and the ability to share applications and information that enhance the reach and richness of organizational integration. We therefore expect higher level of SOA infusion to enhance COI, an ability to integrate systems and processes across inter-, and intra-organizational boundaries of SVN. We postulate the following.

Hypothesis 1: SOA infusion is positively associated with COI

3.2 IT Infrastructure as a Critical Resource: Resource Based View

Since Ref.[35]'s seminal paper, RBV has been widely adopted to define IT infrastructure in many studies [19],[21]. This literature stream suggests that IT infrastructure comprises the shared fundamental resources that need to exist to attain competitive advantage, and that it is a critical business capability. More recently, [36] proposed that IT resources (IT infrastructure was categorized as one of inside-out IT resources in their study) are increasingly emerging as sources of competitive advantage. Because only valuable, rare, inimitable, and non-substitutable (VRIN) resources can lead to competitive advantages according to RBV, researchers have questioned what makes IT infrastructure (and IT resources generally) VRIN. Ref.[37] concluded from an extensive literature review of RBV-based IS studies that suitable blending of organization's various IT resources is the basis for developing competitive advantage. According to their study, suitable blending refers to the unique combination in which IT assets or resources are packaged and interwoven into business practices.

3.3 ITIF and Dynamic Environment: The Theory of Dynamic Capability

The notion of dynamic capabilities emerged as a response to the criticism leveled against RBV, namely, its inability to satisfactorily explain firm behavior and performance in dynamic environments. It is argued that RBV does not explain how and why certain firms have competitive advantages, especially during rapid and unpredictable changes. Ref[38] defined dynamic capabilities as processes to integrate, reconfigure, gain and release resources to match, and even create, market change. Therefore, in order for IT infrastructure to qualify as a key resource from the perspective of dynamic capability, suitable blending at one point in time is not enough. Rather, it can be argued that suitable blending through continuous time frames is necessary. In sum, IT infrastructure flexibility, enabled by SOA initiatives, promotes dynamic capability of continued suitable blending. Accordingly, we postulate that:

Hypothesis 2: SOA is positively associated with ITIF.

This association between SOA and ITIF has already been shown in earlier research by [17],[16],[18] has been included for the sake of completeness, and will be validated as part of our research.

3.4 Towards better CAM

The dynamic capabilities of continued suitable blending allow firms to flexibly connect to other firms and rapidly incorporate their complementary capabilities in their SVN [39]. For instance, the key to developing supply chain (and SVN) coordination mechanisms are the dynamic capabilities resulting from flexibility of the enabling IT infrastructure [40]. Since SVN coordination relies mainly on CAM, which represents the ability to co-ordinate and align resources, activities, and routines that span both within and across organizations in a SVN, we postulate that:

Hypothesis 3: ITIF is positively associated with CAM.

Integration of IT systems and business processes allow transparency and a single, consistent view of information and material flow across boundaries. Access to timely and accurate information through systems and process integration provides collaborative agility to stakeholders – in the form of being able to quickly reposition, realign and maneuver resources, reconfigure assets, elevating the ability to co-ordinate and align resources across the service value chain [11]. Hence, the following is proposed for examination.

Hypothesis 4a: COI is positively associated with CAM.

Hypothesis 4b: COI is positively associated with ITIF.

3.5 What drives service innovation?

CAM, when supplemented by aligned goals and objectives of mutual risks and benefit sharing, leads to a win-win situation for all parties involved in the SVN. Furthermore, partner coordination involves close monitoring of managerial interaction, close communication for conflict resolution, and a clear governance structure for decision making. In our context of SVN, information is a key to knowledge creation and diffusion, and above all, for decision making among service value chain partners. Decisions about technology deployment, Information and Communication Technologies (ICT) integration and better integration of processes on an end-to-end basis provide better transactional benefits. As such, technology adoption, information sharing through systems and process integration across partners enabled by SOA infusion are expected to positively impact CAM, which through the arguments stated above helps drive the service innovation created by the network of partners.
Hence, we postulate that:

Hypothesis 5: CAM is positively associated with ESO

Based on the foregoing brief discussions, the conceptual SOA infusion model is shown in Figure 1. The research model depicts the five main constructs of this
study: the infusion of SOA, ITIF, COI, CAM, and ESO, and the six hypotheses presented above.
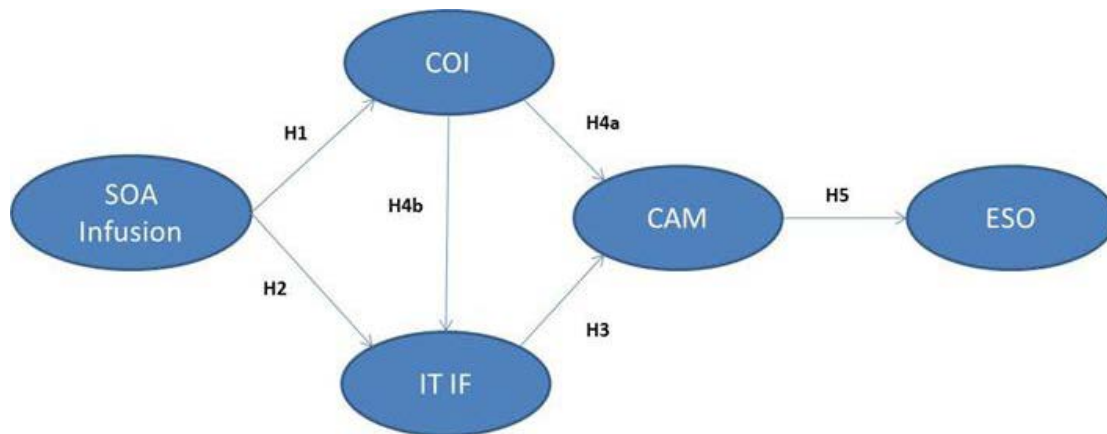

Figure 1: SOA Infusion Model

4. Research design and operationalization

4.1 Research design and data collection

A major telecommunication provider in the Middle East, its partnering organizations, and customer organizations was identified for the exploratory phase of the research. In depth interviews were conducted with top level management of the selected Telco. Interviewees were introduced to the concept of a service system, service innovation, and the various dynamic capabilities introduced and operationalized in this paper. Subsequently, probing questions were posed on corporate strategy, network strategy, customer focus, innovation, technology and process management, and information

and knowledge management. These insights were then translated into the postulated model and summarized. All interviews were recorded and transcribed by a member of the research team.

4.2 Operationalization of the constructs

4.2.1 The Infusion of SOA

SOA infusion is operationalized as a second-order construct, with *IT standards* and *IT architectural design* making up their first-order constructs [42],[32]. The current study adapts the four questions developed by [32] to assess IT standards. They ask the respondents to score the percentage of IT applications which use XML, WSDL, SOAP, and UDDI - the core standards of Web Services. The other first-order construct, IT architectural design, is measured based on the extent to which the organization conforms to the characteristics of SOA in their application [32]. For instance, the respondents are asked to evaluate the level of reusability, modularity, and interoperability among others in their IT applications.

4.2.2 ITIF

As noted, the dimensions of ITIF were proposed by [19] and further refined by [23] who developed the measurements for three dimensions in their study. ITIF measures are adapted from Ref.[23], reflecting *connectivity*, *modularity*, and *compatibility*.

4.2.3 COI

The scales for Collaborative Organizational Infrastructure (COI) were taken from [43]'s *systems orientation*, and *information sharing and dissemination* constructs, with further refinement by [11].

4.2.3 CAM

Earlier literature [44],[45],[46],[47],[48],[49] showed CAM to include the following dimensions: Coordination, Conflict Management, Complementarity and Compatibility, Protection of Assets, and Collaborative Alignment. These are essential managerial skills required to coordinate routines, tasks and activities, and to manage conflict amidst partners, partner fit and alignment in the context of strategic and operational objectives, mutual goals, capabilities, cultures, management styles, and the protection of proprietary assets. Ref.[11] empirically validated the CAM scale comprising of two dimensions, namely partner alignment and partner coordination; this scale is used.

4.2.4 ESO

Ref.[3],[6] have envisaged ESO as a higher-order construct comprising of multiple dimensions, including a new service offering, new organizational structure and service delivery mechanism, and productivity and performance improvements emerging as a result of collaboration. The ESO-Strategic component comprises strategic decision based elements, such as new or modified service offerings, new or modified customer interfaces, new service delivery processes and an expansion into new market segments and/or other industry sectors, arising as a result of collaboration with partners, something which was not possible on individual organizational merits. ESO-Operational is made up of a composite of two sub-constructs based on performance and productivity elements. The first aspect relates to performance, which includes facets related to service customization, utilization of assets, demand capacity, customer satisfaction and service reliability. The second dimension relates to productivity, which includes characteristics pertinent to lead time associated with commercialization of service offerings, service delivery lead times, on-time delivery of services and customer waiting time. Most of the constructs were adapted from extant literature with some minor modifications and additions [50],[51],[52],[53],[54],[55],[56],[57], which have been empirically validated by [3],[6]. Their measurement scale is used for this study.

5. Some exploratory findings

The main findings of the in-depth interviews are summarized below.

The Telco effectively started as a monopoly and recently (2006) started to experience competitive pressures from a second telecommunication company in the area.

5.1 Corporate Strategy

Partnership is a very important key to the Telco's strategy at multiple levels. With the help of third party vendors, the Telco develops solutions for its customers. It relies on its hardware and software partners to develop network solutions. It partners with international research labs to develop different solutions. The Telco has opted to several forms of partnerships such as contractual, supplier-vendor, and plug and play.

Based on The Telco's culture and history, most of its partnerships take the form of contractual arrangements that are based on trust, common vision, and outcome. Some of the Telco's partnerships are of the supplier-vendor type, where suppliers provide infrastructure hardware and software and the Telco ensures it all fits together in the end.

Over the last 4 years, a change has taken place in how the Telco works with its partners. The Telco started to deal with its suppliers from the perspective of meeting customer needs, in addition to securing its own benefits. The Telco partners with several multinational companies such as Microsoft, CISCO, Hewlett Packard (HP), and Dimension Data. The Telco has moved from getting suppliers to provide them with needed products, to having partners manage part of their business via outsourcing.

The Telco has several reasons to establish service networks:
- Competitive pressure from the second Telco in the region.
- Complexity of the Telco's products and services provided to customers.
- Evolution of the Telco from a monopoly position providing simple products and services to a company competing in the market.

The Telco's strategic objectives are reported not to be aligned with partners' objectives. Furthermore, it was reported that the current structure and staff are insufficient. This is reflected in losing 43% of its market share in mobile space in three years. If the Telco continues without major changes, the competitor Telco will overtake them in market space. When the competitor Telco was launched in 2006, the telecommunication market was booming and The Telco's revenue was increasing regardless of the strategy followed. In today's environment, the Telco started to feel the effect of competition and has to work on aligning its strategic objectives with its service value networks and partner objectives. One of The Telco's strategies is to expand globally in order to achieve additional revenue and profits. Yet, the Telco's infrastructure cannot support this strategy.

One of The Telco's major challenges is to understand who its customers are. Its challenge is to be proactive with customers by understanding when to up-sell and when to cross-sell. Relying on partners with a long customer relationship management experience should facilitate this. The Telco's partnering facilitates better understanding of customer requirements and market segmentation (value proposition). The Telco has several major partners which work on network deployment such as Alcatel, Sony Ericson, and CISCO. Historically, the Telco used to buy from the cheapest vendor and eventually ended up with a jigsaw puzzle in infrastructure. Recently, The Telco moved to building strategic partnerships. Having a service network helps in customer segmentation.

The Telco's strategy and decisions are set by the Telco and communicated to its partners. It created a department titled "tech strategy" to change this approach in order to become more collaborative in its relationships with partners.

5.2 Network Strategy

The Telco's role within the service network is not clear as to whether its role is to set the service network strategy upfront, or develop the strategy collaboratively. Given a historical culture that acknowledges power, the Telco did not work collaboratively in the past. The service network establishes a value proposition upfront, however, this value proposition changes over time which leads to projects overruns in time and money. The Telco is learning how important the value proposition's clarity is to sustain partners' commitment to innovative ways of working. The Telco is learning this the hard way because it is not used to working with partners collaboratively. Rather, they used to work based on contractual arrangements not grounded on trust, which can lead to losing the partnership. The Telco's partners try to agree on a common service strategy prior to knowing the new service offering they will launch, but the Telco has a reputation of being hard to work with because of the dynamic nature of its work.

The service network strategy has a major effect on the Telco's competitive advantage. The Telco is not competing on technological innovations brought about by companies like AT&T and Verizon, and is viewed to lag 5 years compared to them. The Telco is viewed to be ahead in G-phone, but needs to differentiate itself from the competitor Telco in customer experience. Customers are switching to the competition because of price and customer service. Today's customers are looking for value and quality of service. However, there are limited options to differentiate the Telco's products and solutions.

5.3 Customer Focus

The alignment with customer needs across the Telco partners' internal functions, processes and practices is deemed critical. In the last two years, the Telco's partners put all necessary resources to proactively support the Telco. The Telco is on a learning curve in terms of this alignment.

As a traditional monopoly organization, the Telco used to do everything in-house, including development of its own ERP system. However, its core competencies are not in developing ERP. In order for the Telco to grow, it started buying its software from the shelf and started outsourcing to concentrate on their core competencies. Currently, the Telco outsources its mobile networks to Ericson and its fixed network will be next, followed by other business parts. The remaining core competencies are business functions (sales, marketing, finance, and HR) and market based (bundling, end-to-end solutions, and moving up the customer value chain). The Telco feels that without strategic changes it will be squeezed out of the local and global markets.

Most of the Telco's outsourcing is cost-based, looking for partners who can provide the solutions at a better price. Over the past 30-40 years, the Telco has been good in delivering its services, but this does not mean that it has an efficient infrastructure or it is good at innovation or running lean operations. There is a need to reduce the response time to the market and deal with the cost issue to increase the quality of service. Around 60%-70% of the Telco's outsourcing is driven by cost.

5.3 Innovation

Working with partners expands the Telco's horizons and provides different points of view to approach the regional market. The Telco's partners have a long history of working in more advanced and sophisticated telecommunication markets, and this has a positive effect on the Telco's business model. The Telco collaborates and shares R&D information with its partners to increase its level of innovation and sophistication. Some of the innovative solutions to be provided in the coming years are:
- Cloud solutions
- Machine-to-Machine solutions

- Richer service portfolio in mobility

All these three areas include partners because the Telco cannot build cloud infrastructure, or have the sole know-how of M-to-M marketplaces. These innovations need a management platform and a command center to be built. The Telco is targeting system integrators who can build mobility solutions and the infrastructure to run them.

The Telco partnered with various consultants to help in reengineering and redefining its business processes. Ericson is working on providing the Telco with an ERP solution which involves business process innovations. Cisco is working on developing tele-presence solutions to businesses using less bandwidth. Organizational change is not coordinated with partners because it is controlled by the Telco's HR, which has a current culture that does not support organizational change. Organizational change is needed within service networks to enable them to operate. Historically, people who were leading the Telco 4-5 years ago were deciding which platform to use. Nowadays, this power has been taken away from them which generated resistance to organizational change.

The Telco approaches vendors who have the right knowledge and recruit people from international telecommunication companies to promote knowledge transfer and sharing. Being in a monopoly situation for several decades, the Telco lacked knowledge transfer and innovation because its job was limited to just getting the service to market. In today's controlled competitive environment, the Telco needs to develop innovative solutions to survive. New solutions provided by the Telco are attractive fields for partners because they are legacy free. The challenge is how to integrate those partners.

5.4 Technology and Process Management

The Telco's technology adoption was dictated by vendors who offered their technologies to the engineering department. In order to become a customer-lead company, a re-focus is needed on the sales and marketing section, who provided the only link between customers and the Telco. Sales and marketing conveys the customer needs and profiles, and the Telco has embarked on a 5-year road map plan to break down customer needs into sales targets. Furthermore, any technological adoption strategy is viewed to depend on company culture and management.

The Telco is owned by the central government which needs to see its share price increase because the Telco contributes 21-22% of the annual budget. The government wants to see this continue, and this is another source of resistance to change to The Telco's ways of running the business and company policies.

The Telco does not develop any hardware technology in-house, but develops some software which is diminishing. This is a changing trend from historical practices, where the Telco used to develop most of its software and even purchased a software development company in India to help in-house software development.

The Telco has a corporate quality department that is ISO certified and has ISO and six sigma specialists that develop processes for the Telco. Before this department was established, other departments were trying to develop companywide processes, but these processes were never adopted. The Telco has processes that span the organization which are developed by independent teams. The Telco started a project (The Telco 2.0) which will start to fix the interrelated problems and processes. As such, the Telco is taking two steps back to go one step forward, which is deemed the right approach given current circumstances. The Telco still operates in silos and there is a belief from the CEO down that there is a need to transform the Telco into a different organization.

5.5 Information and Knowledge Management

The Telco has traditionally been conservative when it comes to knowledge sharing and training. There is no simple approach to share knowledge between departments and organization, and tools to achieve this are lacking. The Telco is considered a secretive organization in this regard, and the organizational culture is also considered an impediment for increased knowledge sharing.

Trust is missing in the Telco due to the current HR culture . During its monopoly phase there was no enemy except a potential fellow employee, because knowledge was believed to be power. This stopped knowledge transfer all-together.

5.6 The Model

Referring back to our research model, SOA is considered very important for the Telco's business, in particular the implementation of the "Falcon" project of implementing a new ERP system with 2-3 years. Project Falcon is a SOA modular-based information system, which will be implemented in phases.

In order to have COI work in the Telco, there is a need to break down barriers such as "knowledge is power". There are flaws in collaboration that have to be rectified. There is also a need to change the people to get COI to work.

The Telco's ITI is very inflexible. Limited connectivity and systems do not communicate with each other. Long programming is needed to make legacy systems compatible for communication. This was an end result from the earlier piecemeal software in-house developments. The Falcon project is expected to resolve this issue. ITI modularity is key to the Telco and a project has been started to address it.

The Telco has the capability to coordinate the resources, but the CAM stage is not very well coordinated. There is a need to add Collaborative Innovative Capacity (CIC) as a construct to the model. CAM is expected to be affected by CIC.

As such, the foundation of our relational model of how SOA may drive service innovation through various dynamic capabilities is reflected in the qualitative assessment of an operating Telco and its partners in the Middle East.

6. Areas for future research

Based on the operationalized constructs and research model, future research could administer a full-scaled survey to a select number of service networks. Such survey will have two target groups: on the one hand IT managers from each partnering firm with responsibility for responding to SOA, ITIF, and COI aspects; and on the other Service managers responding to CAM and ESO aspects – to ensure the selected respondents are truly key informants [41]. Subsequently, all constructs would need to be tested for validity and reliability, and Structural Equation Modeling (SEM) analysis is to be used to analyze and validate paths in the model.

7. Conclusions

In today's competitive environment, frequent changes in services, suppliers, customers, and/or service delivery processes make the development and delivery of new and elevated service offerings critical. Our study shows a conceptual framework of how IT infrastructure flexibility (ITIF) and Collaborative Organizational Infrastructure (COI), enabled by Service Oriented Architecture (SOA), may help firms operating in a Service Value Network (SVN) or Service System realize higher level of Collaborative Architecture Management (CAM), leading to services innovation or Elevated Service Offerings (ESO). A preliminary qualitative study of a Telco and its partners in the Middle East validates the dynamic capabilities at play in our proposed research model. Further Empirical validation of the proposed model will eventually provide practitioners with insights into how elevated service offerings can be enhanced with the infusion of SOA.

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