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THINKING INSIDE THE BOX: FIVE ORGANIZATIONAL STRATEGIES ENABLED THROUGH INFORMATION SYSTEMS

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Abstract

The relationship between information systems (IS) and organizational strategies has been a much discussed topic with most of the prior studies taking a highly positive view of technology's role in enabling organizational strategies. Despite this wealth of studies, there is a dearth of empirical investigations on how IS enable specific organizational strategies. Through a qualitative empirical investigation of five case organizations this research derives five organizational strategies that are specifically enabled through IS. The five strategies; (i) generic-heartland, (ii) craft-based selective, (iii) adhoc, IT-driven, (iv) corporative-orchestrated and (v) transformative provide a unique perspective of how IS enable organizational strategy.

Keywords: Information Systems, Organizational Strategy, Orchestration, Qualitative Analysis.

1 INTRODUCTION

The relationship between information systems (IS) and organizational strategies has been a much discussed topic in academia (Bharadwaj et al. 2013; Byrd et al. 2005; Sabherwal and Chan 2001) and practice (Galliers and Leidner 2014; Kaplan and Norton 2000), with most of the prior studies taking a highly positive view of technology's role in enabling organizational strategies. Such research focuses on topics like; information system's role in strategic advantage (Henderson and Venkatraman 1993), IS as a resource enabling organizational strategy (Byrd et al. 2005), alignment of IS with organizational strategy (Gerow et al. 2014b) and its role in promoting new business strategies (Bharadwaj et al. 2013). Furthermore, recent discussions on Digital Business Strategies (Bharadwaj et al. 2013; Grover and Kohli 2013) specifically focuses on how organizations leverage digital resources to create differential value in business strategy (Grover and Kohli 2013; Rai and Tang 2010).

Admittedly, research on IS and strategy should be perpetual with the advancements in the technology landscape offering technologies with varied capabilities, enabling a wealth of possibilities for supporting organizational strategies. This is especially true considering the advancements of technological, communication, connectivity and analytics introduced in the past several years, unleashing new functionalities and providing new possibilities for organizational strategy (Bharadwaj et al. 2013; Nylén and Holmström 2015). As such, today, organizations are presented with a heterogeneous collection of IS that encompasses myriad capabilities (Aral et al. 2006; Kien et al. 2013), ranging from enterprise systems (ES), cloud computing, mobile technologies and in-memory applications to specialized systems (Lokuge and Sedera 2014a; Sedera et al. 2016; Walther et al. 2013). Thus, organizations no longer solely rely upon a single IS as the sole enabler of organizational strategy (Nylén and Holmström 2015). For example, since the late 1990s, organizations have extoled ES as a salient enabler of strategies (Davenport 1998; Eden et al. 2012; Kharabe et al. 2013; Sedera and Dey 2013). The role of ES in providing strategic capabilities such as operational flexibility (Karimi et al. 2007), business process improvements (Grover and Segars 2005), productivity (Gable et al. 2008; Sedera and Gable 2010; Shang and Seddon 2007), transparency (Akkermans et al. 2003), innovation (Lokuge and Sedera 2014b; Lokuge and Sedera 2014c; Srivardhana and Pawlowski 2007) and ultimately profitability (Romero et al. 2010; Staehr et al. 2012) has been widely discussed. On the other hand, high resource intensiveness (Murphy and Simon 2002), soft resource constraints, such as skill shortage (Srivardhana and Pawlowski 2007), inflexibility (Kharabe et al. 2013), difficulty of use (Gable et al. 2008; Gorla et al. 2010) and difficulties in learning (Gorla et al. 2010; Saraf et al. 2013) purportedly restrict the ability of ES to continue its role as a strategy enabler. Since the mid-2000s, corporate IS has been presented with a plethora of new technology options that dramatically changed the nature of the corporate IS portfolio. The massive proliferation of digital technologies (a term used to collectively represent mobile technologies, cloud computing, in-memory technologies and analytics) (Nambisan 2013; Nylén and Holmström 2015; Sedera et al. 2016; Yoo et al. 2012), fueled by the consumerization of IS has presented organizations with an opportunity to reconsider the role of IS in organizational strategies. The advent of digital technologies signifies an era of technology that epitomizes flexible, easy-to-deploy and cost-effective IS solutions (Nylén and Holmström 2015; Vodanovich et al. 2010). For organizations, digital technologies provide an ecosystem of providers of tools, techniques, and practices, beyond the conventional boundaries of the traditional corporate IS (Adomavicius et al. 2008; Constantiou 2009; Harris et al. 2012; Yoo et al. 2012). In addition to ES and digital technologies, an IS portfolio may encompasses specialized systems that support organizations in performing specific business functions. In general, such systems are specific to the industry sector to which it belongs (Fai and Von Tunzelmann 2001; Nambisan 2013). For example, in banking industry they have ATM controllers, a system used to route financial transactions between ATMs and core systems. These specialized systems can be built in-house or purchased off-the-shelf and are central to the core business functionalities (Chandler 1990). Such systems purport to be highly strategic (and difficult to replicate), especially when they are built in-house, hidden from the competitors (Grover and Kohli 2013). Despite the aforementioned advantages, all systems lose their

ability to enable strategic value over time and must be retired, replaced or upgraded (Swanson and Dans 2000). Furthermore, while each IS (in this case, ES, digital technologies and specialized systems) has its own capabilities, the collective 'orchestration' of multiple technologies can also provide much greater potential in enabling organizational strategies (Cui and Pan 2015; Nevo and Wade 2010). In the current competitive and aggressive corporate environment, organizations are increasingly under pressure to maximize their resources, especially to enhance the values and benefits embedded in their existing IS portfolio (Nwankpa et al. 2013). Thus, the orchestration of existing IS resources to add value provides an alternative to adding new resources suggested in studies like Swanson and Dans (2000). Concurring this view, Nevo and Wade (2010) also conclude that the orchestration of IS resources would lead to higher competitive advantage than the individual effect of each IS.

The broader research question in this study is *what organizational strategies are enabled by IS portfolio?* Herein, specific attention is given to both individual and orchestrated views of IS discussed above. The exploratory nature of this study warranted a qualitative study (Emory and Cooper 1991; Yin 1994), conducted using the case study method. The study comprised an induction phase (Bryant and Charmaz 2007; Strauss and Corbin 1998) analyzing data collected through five cases. In this paper, we develop five IS strategies enabled through the IS portfolio. We present our arguments in the following manner: first, we provide a detailed discussion of IS resources and strategies. Next, the methodology followed is discussed. The induction phase provides insights into how we coded data and analyzed data. The paper concludes with an overview of the study's contributions for research and practice, limitations and recommended directions for future research.

2 RESOURCES ENABLING STRATEGIES

Prior literature on strategy offers a wealth of discussion on how resources enable organizational strategy (Bharadwaj et al. 2013; Grant 1991; Miles et al. 1978; Wade and Hulland 2004). The organizational learning (March 1991) and IT strategy alignment theory (Chan et al. 1997) focused on how organizations divide their attention and resources to different actives. Such as, exploitation, which is associated with activities such as "refinement, efficiency, selection, and implementation" and exploration refers to notions such as "search, variation, experimentation, and discovery." Exploitation and exploration may require fundamentally different strategies. There are many dimensions associated with a strategy leading to the development of numerous definitions. Drucker (1995) defines strategy as the 'theory of the business,' while Porter (1980) identifies it as the 'creation of a unique and valuable position, involving a different set of activities.' Mintzberg (1987) alludes to the multidimensional nature of strategy with his '5-P' definition of strategy. Depending on the situation, a strategy can be viewed as a plan, a pattern, a position, a perspective, or a ploy. Collis and Montgomery (1995) recognize 'value creation' as the major goal of strategy, while Henderson (1989), maintains that the essence of strategy is the establishment of 'unique advantages' over the competitors. There are many strategic analysis and development approaches available such as ten major schools of strategy formulation and analysis by Mintzberg et al. (1998), 'the wheel of competitive strategy' by Andrews (1960), 'portfolio planning' by Allan and Hammond (1975), and 'the balanced scorecard' by Kaplan and Norton (1996). While the philosophic approach and intellectual framework of each school of strategy is different, most share the same basic concepts and tools.

Similarly, there are many approaches to the developmental focus of a strategy. For example, a school of thought based in industrial organization school of economics, as epitomized by the work of Porter's five forces model for industry analysis (Porter 1980), generic competitive strategies (Porter 1980), and value-chain analysis (Porter 1985). The second school of thought is derived from the field of organizational economics known as the 'resource-based view of the firm' (RBV). Originally based on the work of Wernerfelt (1984), this school of thought was popularized by Prahalad and Hamel (1990) and Hamel (1990), Grant (1991), Barney (1991) who articulated the critical concepts of core competency and strategic intent of a resource. It is noted that industrial organization and the RBV hold

diametrically opposed views with respect to the importance of the external environment versus that of the organization's capabilities and resources. According to the industrial organization school, environmental influences represent the primary determinant of organizational success, whereas proponents of the RBV believe that it is the development of an organization's (*internal*) particular set of resources and capabilities that determines its success. Many leading strategists suggest that both viewpoints have validity and that the relative importance of the external environment and organizational capabilities may be contingent on the particular industry, strategy approach and individual business propositions. As Grant (1991, p. 122) states "the types, the amounts of the resources available to the firm have an important bearing on what the firm can do." RBV specifies that the strategic potential of a resource depends upon four properties: valuable, inimitable, rare and non-substitutable (Barney 1991). However, contemporary researchers (e.g. Nevo and Wade 2010; Stankevice and Jucevicius 2010) argue that commonly available IS resources also could play an important role when they are combined together. However, an important (but, rarely stated) paradigm in strategy development is that, while 'everything' must be considered in strategy formation, the formulation of an optimal strategy requires a focus on the relatively *few resources* that are likely to lead to sustained competitive advantage (adhering to the law of parsimony). Thus, the relationship between IS and strategy can be conceptualized in several ways. The connotations explored in this paper are limited to how: (i) an IS enables a strategy (one IS enabling one strategy (1:1), labeled here as the '*primary strategy*') and (ii) how multiple IS orchestration potentially enables multiple strategies (multiple IS enabling multiple strategies (N:M), labeled here as '*orchestrated strategy*'). We acknowledge that one IS could have the potential to enable multiple strategies at once (1:N) and many IS could possibly enable one strategy (N:1). Though such inferences are important and require further investigation, they are beyond the scope of this study.

3 RESEARCH METHODOLOGY

The study design, depicted in Figure 1, demonstrates the research design. To investigate the nature of the strategies enabled through IS, it was required to observe data inductively. The induction phase was inspired by a less procedural grounded theory (Bryant and Charmaz 2007) and was carried out to explore the characteristics of strategies enabled by IS portfolio.

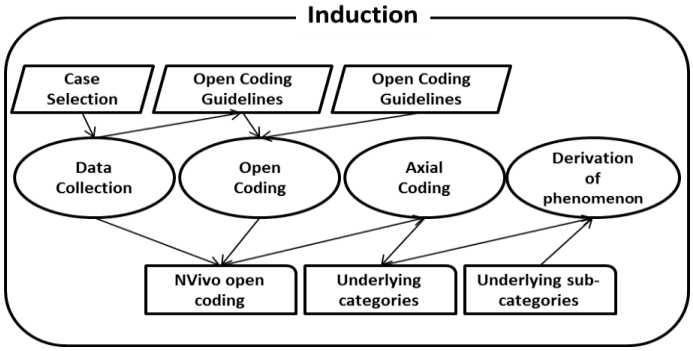

Figure 1. Research design - Induction phase

3.1 Selection of Respondents

A qualitative study approach was followed as it allowed the researchers to capture the qualities, rationales and processes that followed for developing strategies, that cannot be measured or quantified in terms of amount, frequency and intensity (Walsham 1993). There was an expectation that the modern IS portfolio of ES, digital technologies and specialized systems would offer organizational strategies in a different way. As such, the analysis was done using the grounded theory method (GTM)

(Glaser and Strauss 1967). The GTM approach allows discovering of a new phenomenon, its properties and allows uncovering the conditions that bear upon (Bryant and Charmaz 2007; Gasson and Waters 2013). Similar approach has been used in many IS studies (e.g., Orlikowski 1993; Sarker et al. 2001). Considerations of factors related to both control and variety guided the selection of cases (Dubé and Paré 2003) and the sampling was done in a deliberate fashion (Patton 2002). The study sought companies with a portfolio of IS ranging from ES to digital technologies and specialized systems. As a pre-condition, all the selected companies had implemented their ES at least five years ago. Here, all the cases used the market-leading SAP as their ES. The 5-year time span is generally considered sufficient for organizations to reach the onward and upward phase of the ES lifecycle (Markus and Tanis 2000), thereby potentially avoiding organizational turbulence that could add bias to the sample. The selection of organizations that had reached the onward and upward phase was important since it allowed a clear understanding of the effects of ES on continuing strategy beyond the shakedown phase. Further, it was ensured that the cases represented diverse industry sectors and ownership structures (i.e. publically listed and multi-national organizations). The theoretical sampling was used to recruit interviewees. Two main types of informants were sought in each case organization. A discussion of strategy requires knowledge about one's own organization, as well as of the external environment in which the organization competes. With respect to the organization, it is important to have general knowledge about its overall structure, internal operations, and culture. It is also essential to acquire a deeper understanding of those critical business processes that determine the organization's overall success. Thus, the selection of the chief information officer (CIO) and the line-of-business (LOB) managers as the main informants is justified. The first informant was the CIO, or the individual holding an equivalent position (i.e. Chief Technology Officer or Technology Lead). To ensure that data collection occurred in relevant organizations, a preliminary telephone interview was conducted with the CIO of the organization prior to engaging in more intensive data collection. Furthermore, all the cases fulfilled the following criteria: (i) the organization had a dedicated CIO position and a team of IT staff that managed the organization's IS portfolio, including a packaged ES, (ii) the organization had used an ES for the past five years and documentation of the IT roadmap since implementation of the ES was available, (iii) at the time of the data collection, the CIO had been in the position for at least six months, was not in the last six months of their appointment, and was participating in regular meetings with the executive leadership team (e.g. the Chief Executive Officer and Chief Finance Officer) and (iv) the case organization had recently initiated an IT-centric project using one or more digital technologies. In addition to the CIO, the LOB managers and managers from the ES implementation team were interviewed in order to obtain a complete perspective.

3.2 Data Collection

The data collection was conducted through 40 semi-structured interviews, totaling 61 person-hours. All the interviews followed the same case protocol, which included questions about the case organization. Each interview took between 1 to 2 hours and, in most cases, follow-up interviews were conducted for clarification or due to time constraints where the CIO was unavailable for lengthy meetings in a single session. All the interviews were conducted face-to-face, in the English language, between November 2013 and May 2014 and were transcribed.

The five cases involved in the study were TELECOM, MINERALS, AGRO, GOVT and INSURANCE[1]. All five organizations had implemented SAP, Oracle or AS400 as their ES in the period from 1997 to 1999 by a reputable implementation partner. At the time of the data collection, TELECOM and MINERALS were operating in more than two continents, while AGRO – a leading producer of fruits and vegetables – had operations only in Australia. GOVT is a public sector

[1] The cases selected here are referred to with pseudo-names due to the confidentiality agreements signed between the organization and the university.

transportation organization and INSURANCE is a leading private insurance organization in Asia-Pacific region.

3.3 Data Analysis

The analysis steps in the study were inspired by the notions of open coding, axial coding and selective coding (Strauss and Corbin 1998). The open coding involved generating codes from the data, the axial coding involved organizing the codes into categories, and the selective coding involved linking the categories to develop an integrative framework. It is noted that, in line with the tenets of the grounded theory methodology (e.g., Bryant and Charmaz 2007; Glaser 1978), the study's theoretical sensitivity enabled the emergence of ideas and the formulation of a coherent framework based on the subjects' points of view, rather than the forcing of a particular theoretical view onto a focal phenomenon (Corbin and Strauss 1990).

Open coding was done over several consecutive days, where two researchers listened to the recordings together, making notes separately and grouping the similar information using abstract labels (e.g., reliance on ES). This approach (as compared to line-by-line coding of a transcript) provided a continuous free-flowing mental state to absorb the phenomenon of interest. Important too was the "respondent's tone of voice," where the emphasis made in the interview comments helped to understand the importance of the points being expressed (otherwise missed in an analysis of transcriptions). We continued to analyze the data by breaking the transcripts down into distinct concepts or objects and labeled any important information in the process until we found repeating existing labels. Then, as codes were generated and refined, the relationships between the codes were explored (i.e. axial coding) (Glaser and Strauss 1967). Specifically, the causal conditions, phenomenon and contexts were explored. Table 1 in Appendix A provides samples of the open and axial coding derived in the induction phase.

4 RESULTS AND DISCUSSION

It was evident that the strategy enabled by an IS (i.e. ES, specialized systems and digital technologies) in every case organization was *similar*, yet, *differences* were observed when comparing strategies enabled across each IS. For example, in relation to ES, the objective was consistent across all cases – that is to enable a strategy of stability and standardization. Overall, the findings confirm our conceptual view argued earlier on the 1:1 relationship between an IS and the strategy that it enables. Yet, it was speculatively argued that each IS would enable strategies of different characteristics. The orchestration of multiple technologies enabling strategies too was supported by the analysis. Thus, the conceptual argument of N:M (many IS enabling many strategies) was broadly accepted. Here too, differences were observed in the strategies enabled through orchestration. Observations were made in relation to organizational strategies. Through the open coding and axial coding, it was observed that each type of IS enabled a particular type of strategy and the orchestration of the IS enabled two other types of strategies. Five types of strategies were derived through the IS portfolio, and were given titles to reflect their inductively-derived characteristics. They are: (i) generic-heartland strategy, (ii) craft-based selective strategy, (iii) ad-hoc, IT-driven strategy, (iv) corporative-orchestrated strategy, and (v) transformative strategy. Each organizational strategy is described next, summarized in Table 2.

4.1 Generic-Heartland Strategy

The generic-heartland strategy is a proactive initiative that focuses on developing a standardized environment for the generic internal users and core businesses. This strategy focuses on reducing operational costs through routinizing process and has a high lead time. Uncertainty may be considerable when this strategy is first introduced, but wears-off over time. This kind of strategy enables an organization to improve the architecture and the structure of the unit of adoption. It further

reforms the overall design of the organization. Even though the strategy seems to be simple and straightforward, the generic heartland strategy plays an important role. This strategy does not encourage deriving new routines or novel outputs that might devalue the high sunk costs of dedicated, specialized machinery and organizational practices. Furthermore, this strategy focuses on the standardization of inputs and outputs and encourages the development of highly codified procedures and rules within the organization. The locus of control of this strategy is centralized. As such, it requires high codified knowledge. The generic-heartland strategy is initiated by the CIO or the IT staff. The controlling or the continuous evaluation of this strategy is done by the IT staff. The cases also highlighted that the generic-heartland approach might devalue the creativity and minimizes the cognitive and organizational knowledge complexities of the employees. Consistent with anecdotal commentary, cases highlighted that the generic-heartland strategy inhibits organizations' ability to introduce new architectural innovations. A LOB-manager from GOVT stated: "*There is good and bad…mostly all departments are now standardized in their reporting of financials, assets, services and payroll. It is good to know that we are safe at the mothership. But, it kills new ideas. No one is willing to take responsibility for even a small change, as it takes enormously long to break standardization barriers."* The focus of this IS strategy is on the core business processes, therefore it is considered as risky and has a long lead time to reap benefits of strategy execution. CIO of AGRO stated: "*SAP keeps the lights-on, and it does a huge workload in the company…with regard to the main business processes…all our main processes are with SAP*."

4.2 Craft-Based Selective Strategy

The craft-based selective strategy is the primary strategy enabled by the specialized systems. It is a proactive strategy that focuses on specific, selective business functions. For example, LOB Manger of MINERAL stated: "*The system that we use for iron ore extraction comes from a highly specialized company. That's what they have used for 2 decades. Skills of using this are pretty rare"* highlighting the characteristics of specialized systems. The strategy enabled by the specialized systems focuses on meeting the specific needs of particular user groups (both current and potential users). In craft-based selective strategy, both technical and market forms of uncertainty are greater than in the generic-heartland strategy. Here, the case organizations demonstrated that they combined both tacit and codified explicit knowledge and that they needed to combine a range of diverse skills. Further, the cases demonstrated that it was difficult for them to engage in continuing and incremental innovations using this strategy. Here, the primary role of operations and management is transferred from the central entity to the specialization area. The CIO of INSURANCE highlighted some characteristics of the craft-based selective strategy as follows: *"The underwriting software that we use is unique to the insurance industry…well, it's a solution that includes three separate packages…We have a self-service portal, risk assessment center and an analytical part to it. The core engine was implemented 11 years ago when we started the company. We don't change anything in this, apart from when business rules change. That too is only by 2–3 people who know the cracks of it…It is too risky"* the limitations attached to craft based strategy are high risk, technical difficulties and the requirement of high tacit and explicit knowledge for executing the strategy. Considering the knowledge requirement and the high risk nature of it, usually the IT staff controls the evaluation and the continuance of the strategy.

4.3 Ad-Hoc, IT-Driven Strategy

The ad-hoc, IT-driven strategy marks a substantial departure from most longstanding standard business strategic models and marks an entry to strategies that are derived through the capabilities of IS and associated platforms. This is the primary strategy enabled by the digital technologies and initiated by CIO or the specialized LOB department staff. It alludes to a strategy that thrives on the consumerization of IT, whereby the strategy can be dynamically altered using market intelligence. As such, market intelligence and reaction time are paramount for this type of strategy. The CIO of

TELECOM stated: *"We now have a better reach to our customers through our own mobile apps…we get insights through BI and then dynamically offer new packages to our customers"* highlighting the advantages over digital technologies. Further, the availability of IT resources at a reasonable price encourages trialability of strategies. The risk of failure (from a system view point) is minimal, given the affordability and accessibility of such systems. Therefore, even the highly accountable GOVT did not focus much on the sunk cost of IT equipment. However, there is a moderate risk due to high volatility and possible strategic frivolity. The cases demonstrated that the core ideas of this strategy often originate from the LOB and in some cases, from the customers, rather than from the IT department. A LOB manager at GOVT stated: *"for the first time in my work history, our budget allowed us to adopt some systems and access to a system without filling up pages and pages [a project proposal]. We had a good idea on predicting future traffic black spots…using google maps, demographics and senses data. The CIO liked the idea instantly."*

4.4 Corporative-Orchestrated Strategy

The corporative-orchestrated strategy is formulated through orchestrating several information systems. It involves re-structuring existing resources to provide a choice of technologies for the specific kinds of *uses* and *users*. As such, this strategy introduces uncertainty that is greater for both the use and the user. The corporative-orchestration strategy not only requires the mere existence of two or more technologies, it also necessitates that the same information be available for multiple technologies. This strategy also has architectural aspects that reconfigure connections between the technologies and the organizational components. Further, this strategy often will require coordination and orchestration of entities across the organization. Thus, a substantial amount of both tacit and codified knowledge is required. Such knowledge will, in general, come from multiple organizational units. Thus, the complexity of the knowledge base tends to be high.

This type of organizational strategy was observed in the claims processing business process performed by INSURANCE. Concurring with the predictions by some practitioner outlets (e.g., Brinker and McLellan 2014), INSURANCE demonstrated that the organization was eager to integrate digital technologies with traditional business processes embedded in efficiency driven ES in order to innovate and augment existing functions. The CIO stated: *"It's now all about providing options to our workforce and customers… We had the claims process in the AS400 [ES]…The same process now can be done using three ways [ES, mobile and walk-in], and all have to be synchronized. Some do the whole process on the mobile app; some just initiate it in the app, and then come to the office to complete the rest."* This comment alludes to two possible scenarios of the business processes posed by the amalgamation of digital technologies with other IS: (i) the co-existence of other IS and digital technologies in a single business process or (ii) the replacement or substitution of existing IS. In both scenarios, the digital technologies have the potential to provide augmented, value-adding and innovative options for completing a business process, as compared to the default process. The focus here shifts to functional-orientation, as opposed to process-orientation. The engagement of digital technologies herein is not on automating the entire business process, but rather on strategically exposing a selected platform component to build function that would provide maximum value to the organization. For example, LOB Manager of TELECOM stated: "*It's all about convenience. We know the data is in-tact, we can now expose some functions through our mobile / cloud to our customers…Our BI platform looks at the high-end customers and offer them special promotions through the mobile app*" highlighting the extended functionalities that enabled through the orchestration of IS.

4.5 Transformative-Orchestrated Strategy

The transformative-orchestrated strategy is a competence augmenting strategy and often involves the establishment of new business models, ecosystems, products and services through the orchestration of IS. Usually such strategies generate or recognize new needs and uses and/or new users. It is also

possible that this type of organizational strategy will displace existing business models and create new business models. The transformative-orchestrated strategy requires new knowledge that is both cognitive and organizational and the appropriation of dynamic knowledge. As such, the level of both technical and business uncertainty in this type of organizational strategy is high. For example, INSURANCE was contracted by the natural disaster management department of the federal government to understand how claims related to natural disaster could be expedited. The CIO explained: *"When the department had the consortium on dealing with natural disasters, we already had the mobile app to report claims. Together with the TELECOM company, we built a system using mobile alerts, geospatial information, in the cloud to record and assess any natural disasters… there is a component for citizens to report and add details of a natural disaster…this is the first time I did something [like this] with another industry."* Further CIO of AGRO stated: *"My favorite is the google map that we now have in our mobile app. We can now see crop, water, soil conditions, production quantity, and weather all in one place. Through this we have merged some of the employees in our company that we never thought that we would connect."* Considering the diversity of the users connected through this strategy the locus of control is networked in all cases. Usually these strategies are initiated as collaborative launches. The users can be external users or it can be completely new users created through the new business models and business ecosystem. The controlling is also done through the ecosystem members.

5 CONCLUSION

The role of a strategy becomes prominent in the contemporary business landscape for three main reasons. (i) The technological advance: Organizations are provided with an eclectic collection of technologies that provide organizations with high potential for innovation and competitive advantage through their affordability, ease of adoption and ease of connectivity with customers, suppliers and employees. As a result, IT sophistication is no longer proportionate to resource availability. This has paved the path for organizations with a low capital an opportunity to compete in a similar fashion as resourceful counterparts. (ii) The continuous staggering competition: With the advancements in the technology landscape, new business models have emerged. For example, the leading accommodation provider in the world does not own a single hotel and the most popular transportation network company does not own a single cab. (iii) Globalization: The international integrations and trading processes enabled by the advancement in the technological landscape have changed the preferences of the customers and their life-styles. The customers have become demanding as they are provided with varied options. Considering the importance of understanding organizational strategy, the objective of this study was to better understand how IS enable organizational strategies and what types of organizational strategies are enabled by IS portfolio. Making observations from five organizations, this paper specifically reported a collection of primary strategies (1:1) and orchestrated (N:M) strategies enabled through IS.

The strategy development process of (i) analysis and (ii) synthesis was inherently supported by the induction phase of this study. Analysis, which refers to breaking down of a problem into parts, was adhered through open coding of the induction phase. Here, this study purposely broke down the characteristics of each statement that purportedly discussed about strategy into smaller parts. The open codes derived through multiple cases then identified how organizations employ different IS to enable strategies. By itself, however, analysis is insufficient for developing strategy (Mintzberg 1994). On the other hand, synthesis is the process of creating a whole from smaller pieces and may be involved in formulating a list of differential identifies, selecting the most likely identities, and generating scientific hypotheses. In the field of strategy, synthesis is generally referred to as "formulation." The axial coding made the formation of such differential identities a natural outcome. The coalescing of open codes through axial coding made the categorizations meaningful and it derived five strategies that are enabled by IS. The induction data analysis process also takes into account that the interwoven nature of the two intellectual processes of analysis and formulation throughout strategy development.

Overall, this study contributes to the broad body of knowledge in IS and strategic management (Bharadwaj et al. 2013; Gerow et al. 2014a). Though there is a wealth of literature on strategy and strategy formation that spans for decades (Gerow et al. 2014a), organizations still require new and renewed attention to the existing strategies. In today's competitive dynamic business, with the proliferation of digitalization and consumerization of IT, organizations need specific guidelines to marshal their IS to enable strategies. The five strategies derived in this study, though not a panacea of strategies, offer specific guidance of how a strategy can be selected considering their specific comparable characteristics (see Table 2). Here, organizations can consider their IS portfolio, understand the capabilities of existing (or available) IS and then to select appropriate strategies pertinent to them. Further, the five strategies allow organizations to minimize uncertainty – an innate feature of a strategy – through combination of multiple strategies. Earlier organizations had one strategy that fits the whole company. However, the contemporary organizations have multiple products, multiple markets that they target and these lines of businesses face different conditions. Therefore, the orthodox norm of 'one strategy fits all' is not applicable to the contemporary organizations. In this paper, we proposed five types of organizational strategies enabled by the IS. To conceptualize this complex phenomenon of organizational strategy four key dimensions of strategy has been taken into account. They are: (i) the scope of the strategy (resources deployment patterns and objectives), (ii) hierarchical level (e.g. corporate, business and functional), (iii) domain (functional focus vs. process focus) and (iv) intentions vs. realization. In particularly, this paper focuses on IS as means of resources enabling organizational strategies. Usually, the common approach among the organizations is to assume that IS are a result of an organizational strategy. However, the reality is the organizational strategy complies with the capabilities of the organization and the capabilities of the IS. As such, organizations should focus on developing the organizational strategies taking into account the capabilities of IS.

Though the findings are encouraging and useful to organizations, much work is underway to further inform, validate and extend our understanding of the organizational strategies enabled through IS. In order for strategies to be generalized beyond the context of this study, further empirical investigations are required. Two such extensions are discussed here pertain to: (i) deriving the 'assumptions of the future' for each strategy and (ii) estimating the 'degree of uncertainty' for each strategy. In relation to the first, Henderson (1998, p. 261) notes that "business thinking starts with an intuitive choice of assumptions." In devising strategies, managers must deal explicitly with projections and assumptions about the future. In some cases, it may be reasonable to assume that the status quo will continue indefinitely or that certain trends may continue, especially if supported by demographic analyzes, market analytics, or financial projections. However, it is absolutely necessary to state the underlying assumptions explicitly so that others may understand the conditions under which the strategic analysis was performed. In this way, decision makers can determine at a future point whether the existing strategic analysis remains valid. The second area of future work relates to the topic of residual uncertainty (Courtney et al. 1997). In strategic analysis, an estimate of the degree of uncertainty is an important step. Errors in addressing uncertainty may introduce large flaws into the strategy and its execution. Similarly, an underestimate of uncertainty may cause the organization to be unprepared for future crises or newly emergent opportunities. However, overestimates of uncertainty may likewise lead to poor decision making because strategists may over-rely on prior experience or 'sheer gut instinct' in executing or orchestrating strategies. There are several limitations in the current study. First, the current paper does not elaborate on whether an IS could enable multiple strategies or whether multiple IS yield a single strategy. Second, the study does not distinguish the type of digital technology. Instead, it bundles all available contemporary digital technology types as one. While various digital technologies were considered collectively for convenience, we recognize that they may each have distinctive characteristics that could benefit from independent study. Third, the homogeneous selection of organizations in the study sample may add some biasness to the study findings. For example, the inclusion of variables associated with organizational size (e.g. medium-sized organizations), IT maturity, governance and regulations may provide deeper insights. The consideration of such aspects is highly recommended in a future study.

Appendix

Table 1: Illustration of open and axial coding for INSURANCE	
Statement: Open Code (in italics)	**Axial Codes**
"We were one of the first to take AS400 ("*Technology type*" "*single system*" "ES"), 11 years ago ("*limited experimenting*" "*proactive*") as an initiative of our previous CIO ("*initiation*" by the "*CIO*"). It took 1+ year to build it up ("*long lead time*". Staff ("*users*") found it difficult to use ("*technical difficulty*") and some of them didn't even use it at first ("*risky*"). That was a radical change to our business ("radical change" "introduction phase") We have had one major upgrade ("*limited changes*" "*periodic*"). It still does the job, it standardized our business and improved the business as a whole ("*standardization*" "*improve the performance*") and we don't see the need to change to SAP ("*limited experimenting*"). It has the entire company ("*scope*", "*larger coverage*" "*all departments*" "*processes*") heartland (in-vivo coding – "*heartland*" "*IS strategy*") under control. Any changes on this requires ("*controlling"*) a committee of IT executives ("*IT staff*" connotation to "*controlling*"), it takes long time to make changes ("*long lead time*"), so it kills new ideas our staff proposes ("*kills creativity*")"	Strategic Dynamism– long lead time Strategic Space – long term, common businesses, internal focus, larger coverage Locus of Initiation - CIO / IT staff Technology Type– single system, ES: AS400 Locus of Control– centralized Users: generic, internal staff Use: standardized processes Controlling: IT staff Advantages: standardization, operational efficiencies Limitations: technical difficulty, risky, limited experimenting, periodic changes, high codified knowledge, devalues creativity (*) Type of organizational strategy – Generic-heartland
"We introduced ("*initiation*" by the "*CIO*") half-a-dozen specialized systems ("*Technology type*" "*multiple systems*") for very specific things specific to (in-vivo coding - "*specificity*" "*IS strategy*" "*craft based selective strategy*") insurance...like underwriting and premium quotes ("*scope*", "*narrow coverage*" "*specific departments*" "*functions*"). We had to take those at the start of the company...some 11 years ago ("*limited experimenting*"). They change with the business rules …we must have the right staff for this who knows the business very well…("*high tacit knowledge codified explicit knowledge*") I have 2-3 guys specifically assigned to run them ("*specific users*" using "*Technology type*" "*controlling*" by "*IT staff*")"	Strategic Dynamism– short lead time Strategic Space – long term, core specialized businesses, internal focus, narrow coverage Locus of Initiation – CIO, specialized LOB department Technology Type – specialized systems Locus of Control– centralized Users: specific internal staff Use: fulfilling core industry specific business needs Controlling: IT staff Limitations: technical difficulty, high risk, limited experimenting, require combination of high tacit and codified explicit knowledge (*) Type of Organizational strategy – Craft-based selective

Table 1: Illustration of open and axial coding for INSURANCE	
Statement: Open Code (in italics)	**Axial Codes**
"The accident claims department ("*department*") launched our new claims processing app ("*functional*" "*narrow*") in 2 weeks ("*short lead time*") to allow us to connect with customers instantly ("*external focus*"). Once an incident is lodged, we verify and our assessor must reach the location in 30 minutes...and it talks to our AS400 ("*Technology type*" "*ES*") for processing..." We don't have the full spec yet...it keeps changing ("*dynamic*" "*reactive strategy*"). We came up with it by looking at other apps… ("*IS strategy*" "*high trialability*"). The good thing is that our department staffs was able to initiate ("*initiate*" by "*department staff*") these because they do not require much experience and knowledge ("*low tacit knowledge*"). Since these are not costly compared to SAP we are able to actually buy these ("*low cost*").	Strategic Dynamism– short lead time Strategic Space – short term, specialized businesses, internal and external focus, narrow coverage Locus of Initiation – LOB staff Technology Type – multiple Digital Technologies Locus of Control– networked Users: internal Use: reactive, ad-hoc Controlling: LOB staff Advantages: moderate risk, enabled trialability, low explicit knowledge, low cost (*) Type of organizational strategy – Ad-hoc, IT-driven
"Our assessors can initiate the process ("*department staff*" "users") on their mobile app ("*Technology type*"). They can create an incident, and allocate payments. Then the AS400 ("*Technology type*") takes over the process from the administrative side. Our back office then pulls the records from the cloud ("*Technology type*" "*multiple*") and creates an underwriting event. The legal stuff [business rules] ("*internal focus*" "*department staff*") is only in the AS400 ("*Orchestration*" "*partial*"). After underwriting process is completed, then the assessors can see the claim status back on their mobile app ("*Technology type*" "*complete process*"). Our best staff from IT and sales got together and launched this ("*collaborative*" "*initiate*" by "*IT staff*" and "*department staff*") as we required the business process knowledge as well as technical knowledge ("*high tacit knowledge*" and "*high explicit knowledge*". But usually it's department's duty to manage this ("*managed*" by "*department staff*"). But we took a chance; we were not sure how it will work ("*risky*" "*technical and business uncertainty*").	Strategic Dynamism– short lead time Strategic Space – short term, selected collaborative business functions Locus of Initiation – CIO, LOB staff Technology Type – multiple systems, ES, mobile, cloud Locus of Control– networked Users: LOB staff Use: re-structuring existing resources, reactive, ad-hoc Controlling: LOB staff Orchestration - full or partial process, augmenting business functions, foundation: ES Advantages: enabled experimenting Limitations: high tacit and high explicit knowledge, risky, technical and business uncertainty (*) Type of Organizational strategy – Corporate-orchestrated

Table 1: Illustration of open and axial coding for INSURANCE

Statement: Open Code (in italics)	Axial Codes
"We never thought that we could develop an app ("*Technology type*") for disaster management ("*external focus*" "*narrow*") with a department that has very little to do with us ("*external engagement*")…it took less than 6 months to develop from conceptualization ("*short lead time*"). It's managed by us ("*controlling*" "*collaborative*"), the department and people ("*IT staff"* and *"department staff*"). frankly smart mobile was the only common thing [IT] between us, the department and the customer ("*multiple stakeholders*")…the solution had to be simple ("*scope*" "*functional*")…it connects two ES [of the two companies], put a cloud in the middle for data, place it on maps and there we go ("*orchestration of technologies*" "*new business model*")…we have a fabulous app. Our best employees made this possible ("*codified and tacit knowledge*") It has only worked because people contribute to it ("*external users*")"	Strategic Dynamism– short lead time Strategic Space – long term, New business functions/ models Locus of Initiation - collaborative Technology type – multiple systems, ES, mobile, cloud Locus of Control– networked Users: external users, ecosystem users (new users) Use: competence augmenting, proactive Controlling: Ecosystem partners Orchestration: inter-organizational, spiraling, foundation: mobile Limitations: high tacit and dynamic knowledge, risky, technical and business uncertainty (*) Type of Organizational strategy – Transformational

Table 2: Characteristics of organizational strategies

Strategy	Approach	Initiated by	Controlled by	Locus of Control	Focus	Users	Uncertainty	Knowledge required
Generic-heartland	Proactive	CIO	Internal IT staff	Centralized	Internal common-core business process standardization	Generic, mass, internal	High at the introduction, then the risk wears-off	Highly codified, explicit
Craft-Based Selective		CIO, Specialized staff			Internal core business process standardization	Specific, internal	Technical and market uncertainties are very high; remains high	Tacit, codified explicit
Ad-Hoc, IT-Driven	Reactive	LOB staff	LOB staff	Networked	Selected business functions	Internal	Low risk throughout	Low explicit
Corporative-Orchestrated		CIO, LOB staff	Internal IT staff/ LOB staff		Selected collaborative business functions	Internal, external	High in coordination, orchestration	High tacit, high codified explicit
Transformative-Orchestrated		Collaborative	Ecosystem partners		New business functions/ models	New users	Moderately high	High tacit and dynamic

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