Complementarity of Informational and Transactional IT systems in Generating IT-based Business Value

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Abstract

Different IT asset classes generate business value consistent with the strategic goal of that asset class. While transactional IT systems contribute to process efficiencies, informational IT systems generate insights and contribute to informational benefits. We argue that the complementary interactions between these two classes of system make up a new system which is capable of generating firm-level business value. The new system supports effectiveness and efficiency as well as informed and intelligent processes. We use systems theory to conceptualise the complementary interactions and synergy between Business Analytics (BA) systems and Customer Relationship Management (CRM) systems as two examples of informational and transactional IT systems, respectively. The synergy between BA systems and CRM systems will give rise to BA-enabled CRM systems with emergent properties. BA-enabled CRM systems are capable of contributing to significant business value. This paper concludes by calling for further empirical studies to examine the impact of BA systems, CRM systems and emergent BA-enabled CRM systems on business value.

1. Introduction

During the past two decades, information systems researchers have investigated the business value of Information Technology (IT) and reported contradictory results for the direct relationship between IT investments and business value. Despite these mixed results concerning business value, IT has become an integral part of every business and organisations are investing more in advanced information systems to operate, innovate and gain competitive advantage over their rivals. There is a clear need for further examination of business value of IT.

Different IT systems interact and complement each other in generating business value for organisations. Since the emergence of computers, different IT systems have been developed to support business functions and enhance their capabilities. IT systems may be classified into several classes, including infrastructure, transactional, informational and strategic systems (Weill 1992). Each class of IT system addresses specific business requirements and contributes to a set of specific organisational goals. Each class of IT supports the implementation of another and further enables new IT-based business opportunities for organisations. For example, the huge amounts of data generated from transactional IT systems led to the emergence of informational IT systems to take advantage of the organisational data and provide insight for organisational processes. Furthermore, transactional and informational systems complement and reinforce each other in taking competitive actions based on insights, exploiting business initiatives, providing feedback, learning and proposing better business initiatives (Someh and Shanks 2013a). These complementary interactions between IT systems can be a significant source of business value.

The Resource Based View (RBV) of the firm has been widely used to explain the business value of IT resources. The RBV theory argues that sustainable competitive advantage is the result of organisational resources that are valuable, rare, difficult to imitate and non-substitutable (VRIN properties) (Barney 1991). However, the IT business value literature has largely overlooked the possible complementary interactions between different types of IT resources. Particularly, there is insufficient understanding of how transactional and informational IT systems complement and reinforce each other's effectiveness and together contribute to business value. Therefore, this paper will address the following research question:

How informational and transactional IT resources can complement each other in generating IT-based business value?

To answer this research question, we identify three main research streams from the business value of IT and RBV literature. Synergy and systems theory is then used to explain the mechanisms through which informational systems interact with and augment transactional systems to create value. We focus on the complementary relations and synergy between transactional and informational IT systems and propose a research model to explain the business value generated from the interaction between Customer Relationship Management and Business Analytics as two examples of transactional and informational IT systems, respectively. We selected CRM and BA systems due to their significance in creating value for organisations, and because BA systems are widely used to enhance CRM systems. BA systems were identified as one of the four major technology trends in 2012 (IBM 2013). Industry reports and case studies highlight the significance of these systems to managers (Chen et al. 2012; Davenport and Harris 2007).

2. Business Value of IT

Understanding the relationship between IT and business value has long been of attention to information system researchers. Early research was unable to demonstrate that investments in IT provided business value, with some arguing that IT was a commodity and not associated with strategic value (Brynjolfsson 1993; Carr 2003; Lucas 1999). Since then researchers have examined the business value of IT using the constructs of IT investment, resources and capabilities. However, studies in this area still show mixed results for the direct relationship between IT and business value. This is mainly because researchers have applied different conceptualisations, theories, data, measures and analytical approaches to address this problem. Bharadwaj (2000) and Santhanam & Hartono (2003) reported a significant superior performance for organisations with better-quality overall IT capabilities. However, Chae et al. (2014) replicated the same study and did not find support for the same hypotheses in following years, concluding the relationship may not exist. Another body of literature examined the impact of overall IT investment on firm performance. While Aral and

Weill (2007) found no significant variations in firm performance attributed to overall IT investment, a recent study reported a significant positive relationship between total IT investment and firm profitability (Mithas et al. 2012). We argue that establishing a direct link between overall IT investments, capabilities and resources and business value has not provided convincing insights into how IT influences organisational processes and consequently organisational performance. On the other hand, investing in IT is a necessity for organisations and organisations are required to invest in IT to remain competitive. Therefore, investments in IT are not likely to explain the variance in business value (Ray et al. 2005).

We have identified three main research streams in conceptualising the IT construct and examining IT-based business value: (1) IT asset classes generate value consistent with their strategic goals, (2) the indirect relation between IT resources and business value (via IT-enabled business resources) and (3) the contingency perspective on business value of IT resources. This paper builds upon these three research streams to explain the business value of IT. The streams are discussed below.

2.1. IT Asset Classes Generate Value Consistent with Their Strategic Goal

The first research stream argues that different IT asset classes generate business value consistent with the strategic goal of the asset (Aral and Weill 2007). IT asset classes include Infrastructure, Transactional, Informational and Strategic (Weill 1992). Infrastructure assets are the shared IT resources utilised across organisations such as servers, networks, laptops and databases. Transactional IT assets standardise and automate organisational operations to cut costs or increase efficiency for the same cost. Examples of transactional IT systems include operational CRM systems and Supply Chain Management (SCM) systems. Informational IT assets provide information for purposes such as accounting, sales, compliance and communication. Examples include decision support, business intelligence and business analytics systems. These systems support effective decision-making and enable profitable operations. Strategic IT resources help organisations achieve competitive advantage by supporting entry into new markets or by helping to develop new products, services or business processes (such as ATMs in banking). Each of these asset classes will contribute to business value consistent with the strategic goal of that class. For instance, transactional IT investments contribute to reduced costs while investments in informational IT assets influence profitability (Aral and Weill 2007).

2.2. Indirect Relation between IT Resources and Business Value

The second research stream suggests that IT resources positively and indirectly influence firm performance (Bharadwaj 2000; Elbashir et al. 2008; Mithas et al. 2011; Pavlou and El Sawy 2006; Tanriverdi 2005). The indirect influence is through the intermediate contribution of IT resources to business processes. IT resources are deployed in different business processes to enhance their capabilities. IT and other business capabilities together may be conceptualised as higher-order IT-enabled business capabilities, which in turn influence firm performance (Bharadwaj 2000). However, the first-order effect of IT on business capabilities should also be assessed.

2.3. Contingency Perspective on the Business Value of IT Resources

The third research stream provides evidence that achieving value from IT investments is contingent on other organisational variables (Melville et al. 2004; Ray et al. 2005; Weill 1992). This stream is based on contingency theory which attempts to understand the inter-relationships within and among organisational subsystems as well as between the organisation and its environment under varying conditions (Kast and Rosenzweig 1981; Weill

and Olson 1989). The contingency approach suggests that a number of variables will mediate or moderate the relationship between IT and business value. For example, shared knowledge between IT managers and line managers moderates the relationship between IT and customer service performance (Ray et al. 2005). The complementarity of other organisational capabilities (such as management quality and the culture of IT use) to IT investments is another contingency variable that will moderate the relationship between IT and business value (Melville et al. 2004; Aral and Weill 2007). Nevo and Wade (2011) argue that the business value of IT assets is contingent upon their ability to form synergistic interactions with other organisational resources.

We draw on these three research streams to conceptualise our understanding of the value of transactional systems and informational systems implemented in a business unit.

3. Business Value of Transactional and Informational System Classes

Each of the three streams contributes to our conceptualisation as follows. First, organisations invest in different classes of IT system to achieve different goals. A successful implementation of one class of IT system encourages and enables organisations to invest in other classes of IT system. Furthermore, technological advancements and competitive market conditions force managers to invest more in IT, rather than staying behind the competition. This leads to the implementation of multiple IT asset classes in business units. Our focus is on the transactional and informational IT asset classes. While transactional IT systems are implemented in a business unit to increase processes efficiencies and reduce costs, informational systems are implemented mainly to create informational benefits, including more fact-based decision-making, more real-time decisions and a single version of the truth (Wixom et al. 2013). We argue that these two classes of IT systems together should create more value than having the two systems in isolation.

Second, IT influences business value indirectly by enabling and augmenting business unit capabilities. While transactional systems are implemented in a business unit to automate the processes, informational systems are implemented to informate the same processes. Transactional and informational systems together support more intelligent and efficient business processes. We argue that transactional and informational systems together can make up a new higher-level system, in which they will complement and reinforce each other in augmenting the business unit capabilities. The business unit capabilities enabled by these two systems will influence firm-level business value.

Third, the value from IT systems is contingent on other organisational variables. Consistent with Nevo and Wade (2011), we argue that to achieve business benefits, transactional systems, informational systems and business unit capabilities should have a synergistic relationship. We adopt the notion of synergy from Someh and Shanks (2013), where synergy has been conceptualised between IT systems and other organisational systems, each comprising assets, competencies and practices. A synergistic relationship between informational and transactional IT systems is realised when specific enablers and mechanisms are available. The specific enablers include compatibility and integration effort. The specific mechanisms include reinforcement, flanking, compensation, embeddedness, learning and influence.

3.1. Complementary Relations between Transactional and Informational IT Systems to Generate Business Value

Transactional IT systems standardise and automate organisational processes to achieve effectiveness and efficiency and reduce the cost of operations in functional areas of an organisation. Organisations collect extensive amounts of data from their transactional

systems about their customers, internal processes and suppliers. This data is managed, analysed and used for reporting purposes. Although transactional systems support limited analytics and reporting using operational data, advanced analysis of organisational data and the generation of insight require a different set of systems and skills. Informational IT systems offer sophisticated analysis, reporting and visualisation of organisational data. Informational systems would not exist without the transactional systems and the data collected from organisational processes using these systems.

Informational systems enhance organisational operations and their transactional systems by supplying meaningful information and insight to decision-making processes. The enhanced transactional systems enable organisations to take competitive actions leveraging insights from the informational system. On the other hand, transactional systems reinforce the impact of informational systems by automating and embedding insights into their operational processes. These insights would not be exploited and frequently used unless they were embedded within automated transactional systems. Transactional systems help re-engineer business processes and develop efficient and also intelligent processes. The new insights embedded in the transactional system will subsequently generate a new source of data for informational systems to analyse, provide feedback and propose new initiatives. Hence, transactional and informational systems are interdependent and complement and reinforce each other in practice. Figure 1, represents how informational and transactional systems influence the business function and how the IT-enabled business function influences business value.

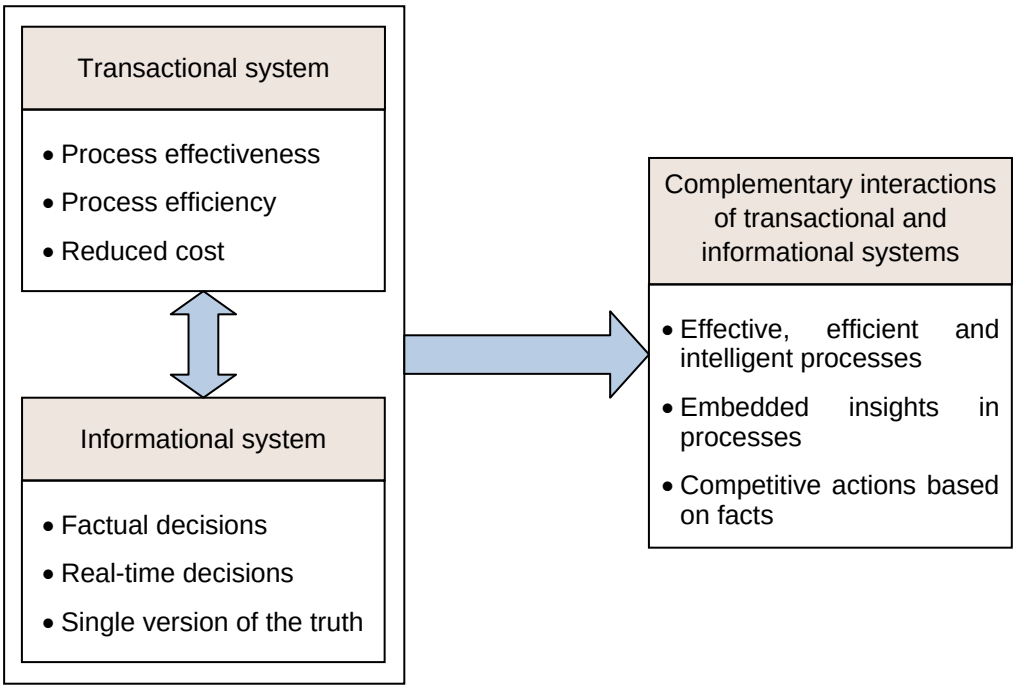

Figure 1. Benefits from transactional and informational systems and their complementary interactions

Historically, CRM systems were designed to reduce the costs of customer-facing operations in sales, marketing and service processes. This was particularly evident in the trend towards call-centre and contact-centre operations where sales and service processes were re-engineered. Process reengineering based on CRM workflows meant that managers had better reporting and control. Transactional CRM systems generated large amounts of customer-related data. As companies began to build more complete customer-related databases, based on customer purchases, service enquiries etc., it became possible to overlay analytical systems. Transactional CRM systems generated much of the data that analytical systems began to exploit for cross selling, up selling and churn prediction in particular. Analytic CRM is enabled by the data generated by operational CRM, together with

other external data obtained from 3rd parties. The insights from the analytical system will improve the decision-making in operational processes.

Aral and Weill (2007) explain this complementary interaction using the 7-Eleven Japanese case study. 7-Eleven uses transactional IT systems to process 35 million sales transactions and 5 million order transactions per day and extracts the relevant data for its informational systems. The data are integrated, analysed and injected back into operational processes. Store workers leverage the insights to take competitive actions and increase sales and profitability.

3.2. Synergy between transactional and informational systems

The synergy between transactional and informational systems is critical in generating business value. The source of this synergy is the complementarity between transactional and informational systems. The concept of synergy refers to a relationship among resources, in which resources interact and enhance each other's capabilities to accomplish organisational tasks and together generate outcomes greater than the additive impact of individual resources (Nevo and Wade 2011; Tanriverdi 2006). Following Someh and Shanks (2013), we argue that enablers and mechanisms together can affect synergy realization.

The enablers of a synergistic interaction facilitate the interaction among resources and influence its success. Compatibility and integration effort are two factors that enable synergy between IT informational and transactional systems (Asadi Someh and Shanks 2013b; Nevo and Wade 2010). Compatibility refers to the degree to which systems fit with each other and is achieved when systems are able to seamlessly work together. Compatibility between transactional and informational systems ensures that the transactional system (people and processes) are able to work with informational tools and functionalities. Conversely, the informational tools should match the decision needs of the transactional system, as different organisational resources may need different informational needs (Isik et al. 2011). Integration effort refers to the effort of management to bring transactional and informational resources together and direct and support their interaction congruent with organizational goals (Nevo and Wade 2010). Management is responsible for managing the change and properly accommodating informational resources in relationships with transactional resources.

Mechanisms are the processes and activities that take place among resources to realise their potential synergy and they are of two types: complementarity mechanisms and boundary spanning mechanisms. Complementary mechanisms refer to the activities by which resources are combined to enhance and complement each other's functionalities. Complementary mechanisms for realising synergy include reinforcement, flanking, and compensation mechanisms. Reinforcement mechanisms occur when informational and transactional resources consistently work with each other, add crucial contributions to each other and enhance each other's organisational impact (Ferratt et al. 2012; Horgan and Mühlau 2006). Flanking mechanisms occur when one resource creates conditions that enable another resource to improve its effectiveness (Ferratt et al. 2012). In the case of compensation mechanisms, one resource blocks or diminishes the negative effects of another resource with respect to organisational goals (Ferratt et al. 2012; Wade and Hulland 2004).

Boundary spanning mechanisms refer to the processes and activities that help resources to bridge the knowledge gap between domains. Boundary spanning occurs when individuals cross the boundary of one social group and interact with another social group. Three boundary spanning mechanisms relevant to informational and transactional systems are embeddedness, learning and influence. The embeddedness mechanism enables boundary spanners from the informational area to cross their own boundary and make social ties with their counterparts in transactional areas. These social ties can be exploited to develop social capital, and exchange and disseminate knowledge. Informational systems can utilise the learning mechanism to understand transactional people and processes and develop a shared language to interact with them. This also helps informational systems to sense and

exploit new opportunities to implement initiatives in other functional areas. Furthermore, BA systems can evaluate the effectiveness of their initiatives after implementation and learn from their experiences (Shanks and Bekmamedova 2012). Influence mechanisms enable BA systems to change the core values and norms of their counterpart transactional areas and encourage them to adopt and use BA in their processes and routines.

The synergistic interaction realised between transactional and informational systems will lead to extended or new functionalities in both systems. This interaction will support the value-creation for both systems beyond their individual competency. To build upon the three research streams, complementarity and synergy between transactional systems and informational systems, we use systems theory to conceptualise the business value generated from the two systems and their interaction.

4. Systems Theory

Systems theory deals with systems taken as a whole, rather than individual parts (Ackoff 1971). A system is a composite thing comprising a number of parts (subsystems), which interact to accomplish a set of goals. The interactions among parts constitute a whole, which is greater than the sum of the individual parts. The whole system, derived from the synergistic interaction of the parts equals the sum of its parts plus their interactions (Ackoff 1971). However, it is very complex to model exactly how subsystems interact to constitute a whole. Rules and laws can never be used to explain the evolution of a system, as there are a large number of options and associated decisions at each point in the system's evolution (Corning 2002). However, the properties, patterns and structure that emerge from the interactions are an effective way of studying the whole. The new properties derived from the subsystem's interactions are called emergent properties. The emergent properties of a collective system are the things that can be perceived and measured (Corning 2002).

An organisation, with respect to systems theory, can be conceptualised as a set of interconnected systems (Kast and Rosenzweig 1981). This contrasts with the RBV, which views an organisation as a bundle of resources (Barney 1991). The use of systems theory helps to model the interaction among resources, which is not possible using RBV theory. A system from the systems theory perspective corresponds to a resource from RBV theory. An organisational resource is a combination of assets and capabilities (Aral and Weill 2007). Assets are the technologies that organisations invest in to enable their functional competency (Aral and Weill 2007). Capabilities are the interlocking systems of competencies and practices within the organisation (Aral and Weill 2007).

5. IT Business Value Generated from Business Analytics-enabled CRM Systems

The research model (Figure 2), explains how the quality of BA resources (conceptualised as BA systems) and CRM resources (conceptualised as CRM systems) can influence business value. BA and CRM systems both comprise assets and capabilities. Based on systems theory, the BA and CRM systems interact and complement each other. If their relationship is synergistic, BA-enabled CRM systems will emerge from their interaction. BA-enabled CRM systems possess emergent properties and contribute to business value. The definitions of constructs are explained below and summarised in Table 2 and the hypotheses follow.

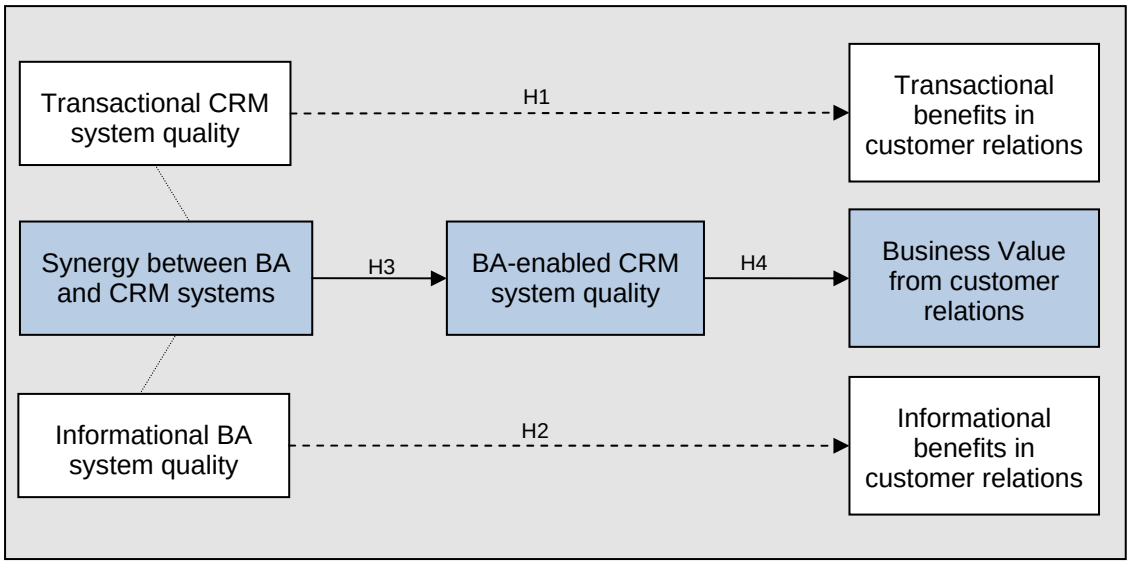

Figure 2. Business value created from the complementary relations between BA and CRM systems

Table 1. Definition of constructs in the research model

Construct	Definition	Reference
Transactional CRM system quality	The degree to which CRM systems are successful in standardising and automating customer-facing operations in marketing, sales and service areas.	(Buttle 2004; Iriana and Buttle 2006)
Informational BA system quality	The degree to which BA systems are successful in storing, analysing, reporting and interpreting high quality data.	(Davenport and Harris 2007)
Synergy between BA and CRM systems	The degree to which BA and CRM systems can jointly accomplish organisational tasks and enhance each other.	(Nevo and Wade 2010, 2011)
BA-enabled CRM system quality	The degree to which BA-enabled CRM systems are able to leverage analytical insights provided by BA systems in customer-facing operations.	(Buttle 2004; Iriana and Buttle 2006)
Transactional benefits in customer relations	Benefits achieved from the use of transactional CRM systems such as process efficiencies, effectiveness and cost reduction.	(Buttle 2004)
Informational benefits in customer relations	Benefits achieved from the use of informational BA systems such as fact-based decision-making, real-time decisions and single version of the truth.	(Wixom et al. 2013)
Business value from customer relations	Firm-level benefits an organisation receives from the use of CRM, BA and BA-enabled CRM systems.	(Coltman 2007)

Transactional CRM system quality: *CRM system quality* refers to the degree that CRM systems are successful in standardising and automating customer-facing operations in the marketing, sales and service areas (Buttle 2004). CRM systems are an instance of transactional IT systems (Aral and Weill 2007) and their organisational goal is to reduce the cost of transacting with customers through achieving efficiency and effectiveness in customer-facing operations (Buttle 2004).

BA system quality: *BA system quality* refers to the degree that the BA systems are successful in storing, analysing, reporting and interpreting high quality data (Davenport and Harris 2007). BA systems are an instance of informational IT systems (Aral and Weill 2007) and their organisational goal is to provide the right information to the right people on the right time (Davenport and Harris 2007).

Synergy between BA and CRM systems: Synergy between BA and CRM systems refers to the degree to which the BA and CRM systems can consistently work with each other and jointly accomplish organisational tasks. The synergy between BA and CRM systems is only

realised when the BA system complements and reinforces the CRM system by providing it with new or modified capabilities which will contribute to the CRM system's effectiveness (Nevo & Wade 2010). The synergy between BA and CRM systems is realised through the enablers and mechanisms discussed in the previous section. The specific enablers and mechanisms for the synergy of CRM and BA systems include compatibility, integration effort, reinforcement, embeddedness, learning and influence.

BA-enabled CRM system quality: *BA-enabled CRM system quality* refers to the degree to which the BA-enabled CRM system is able to leverage analytical insights provided by the BA system in customer operations. The BA-enabled CRM system is composed of the BA and CRM systems and its quality depends on the quality of the emergent properties arising from the synergy between BA and CRM systems.

Transactional benefits in customer relations: Benefits achieved from the use of transactional CRM system in customer relations including process efficiencies, effectiveness and cost reduction (Buttle 2004).

Informational benefits in customer relations: Benefits achieved from the use of informational BA system in customer relation including fact-based decision making, real-time decisions and single version of the truth (Wixom et al. 2013).

Business Value: *Business value* refers to the benefits that an organisation achieves from the use the emergent BA-enabled CRM system. The BA-enabled CRM system will generate transactional and informational benefits as well as contributing to firm-level business value such as profitability.

Hypotheses Development (Hypotheses 1-4)

The hypotheses associated with research model are explained below.

In the research model, the variance in business value from the use of BA systems and CRM systems is explained by the quality of the CRM, BA and BA-enabled CRM systems. CRM systems are able to create business value individually. CRM systems, as a subset of transactional IT systems (Aral and Weill 2007), will generate transactional benefits for the organisation. Thus, it is hypothesised that:

Hypothesis 1: *CRM system quality has a positive effect on transactional benefits.*

BA systems are also able to generate business value. BA systems, as a subset of informational IT systems (Aral and Weill 2007), will create informational benefits (Wixom et al. 2013) for the organization. Therefore, it is hypothesised that:

Hypothesis 2: *BA system quality has a positive effect on informational benefits.*

In the research model, it is hypothesised that the variance in business value from the use of BA and CRM systems in customer relations is explained by the level of synergy between the BA and CRM systems and quality of the emergent BA-enabled CRM system. These hypotheses are based on systems theory and the concept of synergy between systems, as the main driver of business value from IT.

The synergy between BA and CRM systems will give rise to BA-enabled CRM systems over time with emergent properties. Emergent properties are new and extended capabilities of CRM people to take competitive actions based on insights provided by the BA system. The competitive actions include cross selling, up selling and targeted marketing based on the insights from customer value analysis, customer behaviour analysis and customer segmentation (Goodhue et al. 2002). The BA-enabled CRM system uses the CRM system to collect customer data over time from many different touch points. The BA system analyses the data with different analytical tools and proposes a variety of tailored services, which can be automated using the CRM system and then frequently used. This use of BA systems has transformed the role of CRM from an operational tool to a strategic tool for organisations to innovate, compete and gain competitive advantage. Greater synergy between BA and CRM systems will result in a BA-enabled CRM system capable of generating organisational value

greater than the additive value of the BA and CRM systems in isolation. As a result, it is hypothesised that:

Hypothesis 3: *The greater the synergy between BA systems and CRM systems, the greater the quality of BA-enabled CRM systems.*

Synergy between BA and CRM systems leads to the emergence of BA-enabled CRM systems with new properties. Examining the value of systems in isolation will not capture the emergent properties. Therefore, BA-enabled CRM systems should generate organisational value in addition to the informational and transactional benefits of the BA and CRM systems. So, it is hypothesised that:

Hypothesis 4: *BA-enabled CRM systems generates business value in addition to the informational and transactional benefits of the BA and CRM systems.*

6. Conclusion and Discussion

The theoretical model developed in this paper explains how BA systems and CRM systems complement and reinforce each other in creating the business value. BA systems as a subset of informational IT systems will contribute to informational benefits. CRM systems as a subset of transactional IT systems will contribute to transactional benefits. However, BA and CRM systems will influence business value indirectly by forming higher-order BA-enabled CRM systems. BA-enabled CRM systems support both cost-effective and informed customer-facing processes. This conceptualisation has five implications for the business value of IT literature.

First, the business value of IT literature to date has only focused on examining business value generated for one type of IT systems. This underestimates the business value created from the interaction between different IT systems. This paper investigates the value of two classes of IT systems implemented concurrently in one organisational unit. It conceptualises the interactions and complementary relations between them and proposes that the two systems together can create greater business value. This is consistent with the current competitive business environment, in which organisations invest in multiple IT systems.

Second, the relationship between IT and business value is indirect, through the mediating role of organisational processes. We argue that multiple IT systems and other business resources interact and new systems emerge from their interaction. Due to path dependencies and the complex social structure in their evolution, emergent IT-enabled business systems are capable of creating significant business value and contributing to competitive advantage.

Third, our conceptualisation implies that having two high-quality systems is associated with limited benefits and not necessarily a driver of business value. How the two systems work together, complement each other and have synergy, is critical in leveraging the IT systems and creating IT-based business value. We argue that synergy among systems will lead to higher-level business systems with extended capabilities and functionalities. The synergy ensures that the systems are able to consistently work with each other and make critical contributions to each other's organisational effectiveness.

Fourth, this paper also builds on the synergy conceptualisation including compatibility and integration effort as synergy enablers and reinforcing, flanking, compensation, learning, embeddedness and influence as its mechanisms. This extends the synergy, RBV and complementarity (Aral and Weill 2007) literature as well as enriching the fit concept (Venkatraman 1989) and the theory of task-technology fit (Goodhue and Thompson 1995).

Fifth, each system includes assets as well as capabilities. This signifies that technological assets alone are not a source of value. However, complementary organisational IT capabilities are important in creating value.

For practitioners, the research model provides a means of understanding the importance of the complementary relations between different IT systems. This will effect manager's IT investment decisions in choosing systems that will complement their current IT systems. It also signifies the importance of bringing the systems together and facilitating synergistic interactions among them to generate business value and gain competitive advantage.

7. Future Research Direction

We have proposed a model, which explains how two classes of IT system can collaboratively create IT-based value for organisations. The research model proposes four hypotheses to test the business value of CRM systems and BA systems in isolation and compare it with the value created by the BA-enabled CRM system. Empirical confirmation and refinement of the research model is an important research direction to follow. We will design and conduct a survey to collect data from BA and CRM managers to test the four hypotheses.

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