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IT-ENABLED MANAGEMENT CONTROL SYSTEMS TRANSFORMATIONS: LESSONS LEARNED FROM SAVECOM

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Abstract

Information technology (IT)-enabled organizational transformations are emphasized in a great deal of research. However, IT-enabled management control systems (MCS) transformations to facilitate management for steering an organization toward its strategic objectives have become relevant and important, yet underexplored. To address this gap, the present study illustrates how a business intelligence (BI) system enables the transformations of organizational MCS. Through an in-depth case study of a Taiwanese telecommunications company, the IT features, and their direct effects and induced effects to MCS are analyzed in terms of an organization's belief systems, boundary systems, diagnostic control systems, and interactive control systems. The implications for the organizational MCS design of these effects are discussed.

Keywords: IT-enabled change, Organizational transformation, Management control systems.

1 INTRODUCTION

The role of information technology (IT) interventions in organizational change, especially as the vehicles of enhanced business and managerial efficiency, has been a hot research topic (Bostrom et al., 2009). This research stream often incorporates models that generally prescribe information technologies as enabling agents for organizational change. For example, many studies have reported the IT-enabled changes such as the sharing and exchanging of organizational information (Davenport, 2000), forming a network of enterprise resource planning (ERP)-enabled organizations (Ash and Burn, 2003), and business process change (e.g., Chatfield and Bjørn-Andersen, 1997). However, as criticized by Rice and Gattiker (2001), most extant studies have treated ITs in much the same way as conventional production or mechanical technologies. That is, those mentioned transformations have predominantly focused on the technology-centric effects of IT.

Organizations are man-made and remade by man (Lundin and Steinthorsson, 2003) and IT can be conceptualized as socio-technical systems (Molla and Bhalla, 2006). According to theories of socio-technical systems (e.g., Bostrom et al., 2009), an organizational work system consists of social and technical subsystems, interacting with and influencing each other. The effects of a newly implemented IT can, over time, lead to changes in social structure of an organization and information enabled by IT is then implicated in organizational action (Leonardi, 2007). Therefore, to understand the real value of IT, one should look beyond the technology-centric effects and endeavor from implicit effects of IT to understand how IT can change the organizational rules of what people are doing. For example, IT may change people and organizations by empowering them to do things they could not do before and by preventing them from working in an old, unproductive way (Lynne and Benjamin, 1997).

In studying IT effects in organizational activities and behavior, this paper focuses on the organizational management control systems (MCS). Control systems are fundamental to all organizations (Scott, 1992) and Davenport (1998) suggested that effective utilization of IT can be associated with changes in jobs, skills, and control processes in behavior, values, and norms. Indeed, the management of any organization must develop a control system tailored to its organization's goals and resources, but how IT enables the organizational control transformations has not yet been demonstrated persuasively. In particular, this paper examines the IT-enabled MCS transformations, which are defined as the formal, information-based routines and procedures managers use to maintain or alter patterns in organizational activities (Simons, 1995). An MCS, including the employees' belief systems, is designed to help an organization adapt to the environment in which it is set and to deliver the key results desired by stakeholder groups (Merchant and Otley, 2007).

Even today, studying organizational MCS is of critical importance since managers still currently face the dilemma in maintaining control, efficiency, and productivity while giving employees the freedom to be creative, innovative, and flexible. In this study, Simons' (1994, 1995) "levers of control" is employed as a framework to explore the transformation of MCS by a firm's new IT. The levers of control aim to understand how it is that managers use innovative control systems to drive strategic renewal. By employing this concept, this paper aims to explore how IT enables the transformation of control systems, and, in turn, to drive strategic renewal. In addition, since the assessment of the organizational consequences of IT may include direct and induced effects (Agarwal and Tanniru, 1992), specific IT features that enable the MCS transformation are identified as well as the direct and induced effects in enabling change.

Using a case study of SaveCom, a Taiwanese telecommunications company, a description is presented of the business intelligence (BI) initiative undertaken by the case company in seeking to develop a new strategy of "providing customized services in niche markets and enhancing customer values." The primary contribution of this paper is to extend understanding of the IT features and both direct and induced effects in the MCS transformation process, and then to drive the strategic renewal.

2 THEORETICAL BACKGROUND

Organizational transformation can be defined as simultaneous major changes in key activity domains, such as strategy, structure, and power distribution, which typically occur during a brief time interval (Wischnevsky and Damanpour, 2006). The transformation is the process of fundamentally changing an organization's processes in order to allow it to better meet new challenges (Palmer and Handy, 2000). Organizational transformation like personal change is always difficult to achieve. Employees are the "major players" in companies, but they are also considered to embody inertia (Floyd and Lane, 2000). Employee cooperation and direct participation in a transition have long been regarded as a way to decrease employee resistance to change and increase organizational adaptability. However, resistance to transformation is still often expected and there are many conscious and unconscious obstacles on the path toward change. Accordingly, many previous studies have also focused on the roles of organizational inertia, conflict (i.e., Floyd and Lane, 2000), organizational learning (i.e., Crossan and Medrow, 2003), and organization- stakeholder relations (Tan and Pan, 2003) in transformation processes. Additionally, much research has explored other various factors thought to influence the organizational transformation such as change forms (Lengwiler, 2003), leadership (Dess et al., 1998), and institutional strategy (Lawrence, 1999).

In studying organizational transformation, IT is often underexploited, but it can be an important enabler and integrator (Moreton, 1995). IT-related organizational transformation refers to the changes occurring over time in organizational systems and structures that are necessary to reap the full benefits from the use of IT (Gregor et al., 2006). However, IT-enabled organizational transformation is also very difficult to achieve. For example, Lynne and Benjamin (1997) comment that "when we examined what many people think about who should do what in IT-enabled change, we found that they seem to believe in magic; the joint efforts of all parties playing their scripted roles do not add up to successful change." Moreover, Sarker and Lee (1999) also identified three critical factors, which have an influence on the IT-enabled transformation processes and outcomes including top management leadership, communication, and IT knowledge and management. In addition, value realization from IT depends on time-consuming investment in organizational change that is often intangible (Gregor et al., 2006).

In terms of organizational control systems, Lorange and Scott Morton (1974) have identified three important aspects of technology with respect to control systems including the management information system support, the measurement techniques, and mathematical techniques for the MCS. In fact, management control in an organization is a social process in a social system (Hofstede, 1978) and MCS are tools to aid management with steering an organization toward its strategic objectives (Anthony & Govindarajan, 2007). Control systems provide strategic direction to the innovative efforts of firms and the efficiencies they produce can free up resources for innovation (Marginson, 2002). Simons (1994) defined MCS as: the formal, information-based routines and procedures used by managers to maintain or alter patterns in organization activities. Based on a 10-year examination of control systems in over 50 U.S. businesses, Simons (1994, 1995) identified three new control systems that allow strategic change including belief systems, boundary systems, and interactive systems. These four control systems, according to Simons, will provide managers with the basic levers for pursuing strategic objectives.

Based on Simons' (1995) MCS theory, a belief system is the explicit set of organizational definitions that senior managers communicate formally and reinforce systematically to provide basic value, purpose, and direction for an organization. Belief systems communicate core values and provide inspiration and direction. Boundary systems delineate the acceptable domain of activity for organizational participants. That is, boundary systems frame the strategic domain and define the limits of freedom. Diagnostic control systems are used to motivate, monitor, and reward the achievement of specified goals and are the formal information systems that managers use to monitor organizational outcomes and to correct deviations for preset standards of performance. The interactive systems are used to stimulate organizational learning and the emergence of new ideas and strategies. The purpose of interactive systems is to provide flexibility in adapting to competitive environments and to

encourage organizational learning. Table 1 summarizes the nature, purposes, key design variables, of four categories of MCS and the observation needed for studying IT-enabled MCS transformations.

Table 1: Four Categories of MCS (adopted from Simons, 1994, 1995)

Systems	Nature of Systems	Purpose	Key Design Variables	Observation Needed
Beliefs systems	Explicit set of shared beliefs that define basic values, purpose, and direction.	Provide momentum and guidance to opportunity-seeking behavior.	Core value	How IT implementation can lead to the transformation of an organization's basic values, purpose, and direction in order to ensure the formation of organizational strategies.
Boundary systems	Formally stated limits and rules that must be respected.	Allow individual creativity within defined limits of freedom.	Risks to be avoided	How IT implementation can lead to the transformation of an organization's formally stated limits and rules in order to ensure to frame the strategic domain and define the limits of freedom.
Diagnostic control systems	Feedback systems used to monitor organizational outcomes and correct deviations from preset standards of performance.	Provide motivation, resources, and information to ensure important organizational strategies and goals will be achieved.	Critical performance variables	How BI implementation can lead to the transformation of the ways that organizations monitor organizational outcomes.
Interactive control systems	Control systems that managers use to regularly and personally involve themselves in the decisional activities of subordinates.	Focus organizational attention on strategic uncertainties and thereby provoke the emergence of new initiative and strategies.	Strategic uncertainties	How BI implementation can lead to the transformation of the ways that managers use to regularly and personally involve themselves in the decisional activities and encourage organizational learning.

3 THE RESEARCH METHOD

In this study, the main research strategy adopted is an interpretive in-depth case study (Walsham 2006). This case study analyzes the practices of the IT-enabled MCS transformation process and presents findings from a detailed case study of a Taiwanese telecommunications company, SaveCom, and describes a BI initiative undertaken by the case company in seeking to ensure their renewal strategy.

This research is primarily based on 20 interviews with SaveCom, supported by secondary information. All interviews were conducted with managers with at least 5 years of working experience. Personal interviews were supplemented by direct observations, as well as documents and artifacts including organization charts, annual reports, and internal documentation. The multiple sources provided for triangulation (Stake 1994) of evidence, ensured that facts stated by one organization could be verified by the other, and also provided multiple perspectives on issues. All informants were scrutinized carefully and then selected to ensure the quality of the data. The face-to-face interviews were unstructured; the standard set of questions used was designed only to help initiate and guide the interview process. Additional observations were noted immediately after each interview was completed. Questions were deliberately broad in scope and focused on fundamental aspects of BI, MCS, and organizational transformations. Probing followed each question, particularly to obtain elaboration of the answers and to ascertain examples of the BI development process.

Following data collection, data was analyzed based on the work of Wolcott (1994) and Weaven and Herington (2007). This effort incorporated three major phases of description (relying heavily on verbatim quotes from interviewees), analysis (identifying important factors, themes and relationships), and interpretation (making sense of meanings in context). To achieve this process, the open coding technique of grounded theory (Strauss and Corbin, 1990) was also employed in data analysis. Open coding is the part of the analysis concerned with identifying, naming, categorizing, and describing phenomena found in the text. The BI-related actions can be identified and categorized and their influence on MCS can therefore be explored. Also, to reduce research bias and to validate that no important information should be missed in the case analysis, the interview transcripts were shown to another researcher who played the role of an independent reviewer. The involvement of this independent reviewer was to bring a different and possibly more objective eye to the evidence

(Eisenhardt, 1989). The data collection and analysis helped elicit the effects of BI development, which was used to address the research objective.

4 THE CASE AND FINDINGS

In 2000, by merging an Internet company that owned Taiwan Network Access Point (TWNAP), the first and the major Internet exchange centers in Taiwan, SaveCom transformed themselves from a wireless paging operator to a Voice over Internet Protocol (VoIP) service provider. As VoIP technology matured, after 2004, SaveCom's VoIP business began to stabilize. After reexamining their position and industrial environment, SaveCom formulated their strategy to provide customized services for customers in niche markets where the large telecom companies would not go. At the same time, SaveCom started to consider how IT could facilitate business operations and how they could ensure the strategy would be implementable. In 2005, SaveCom started a 2-year BI initiative. In 2007, the BI system was completed and it has been used to strengthen the overall operation. The following paragraphs present the case analysis and summarize the key findings for the MCS transformations along the four levels of control: belief systems, boundary systems, diagnostic control systems, and interactive control systems.

4.1 BI-Enabled Beliefs Systems Transformation

A belief system is the explicit set of organizational definitions that senior managers communicate formally and reinforce systematically to provide basic value, purpose, and direction for an organization. Belief systems are used to inspire and direct the search for new opportunities. Vision and strategies should give employees the sense of direction and company values so they can fulfill their tasks in a fast-changing, volatile environment. Before introducing BI, SaveCom used conventional ways to search for new customers.

4.1.1 BI Drives Pervasive Intelligence Across the Enterprise

Before the development of BI, SaveCom's main strategy was the "maximum number of customers" to increase the company's revenue. SaveCom's BI has been designed to drive pervasive intelligence across the enterprise and to align the strategic purpose as well as the financial and operational management processes. These functions help SaveCom to see through the blind spots. For example, the BI system shows that if SaveCom cannot retain their new customers and keep using their services for a period of time (1 year), the company actually loses money. This finding enables SaveCom to redefine their value creation strategy from the "maximum number of customers" to "customization for their profitable customers and to retain valuable customers." This strategic change also induces the introduction of a new business credo to retain valuable customers: "We serve customers proactively to increase customer value." SaveCom believes they must provide reasonable quality, good service, and a competitive price, as indicated by GM in the following statement:

"The most important issue is that we must become proactive to enhance customer value. First, we must be able to predict what our performance is and then make decisions and coordinate. Following this, we then do the analysis again, and check the performance again in order to improve our services! The BI system allows us to see more clearly this whole (value creation) process and the operation can be closer to our strategy."

4.1.2 BI Capitalizes on the Value of Corporate Data

SaveCom's BI can also integrate the information from financial performance management, operational intelligence, and transactional applications. By integrating corporate-wide data, SaveCom capitalizes on the value of data and enables the company to become more agile. For example, the BI system shows that SaveCom's cooperative hardware vendors (what SaveCom calls business-promoting consultants) contribute greatly to the firm's performance and establish the link between SaveCom and their customers. In order to be agile and to respond to these business-promoting consultants and their customers, SaveCom tunes their own orientations to be more flexible, sensitive,

and to quickly respond to customer needs. Based on this, SaveCom induces the customer-centric orientation as their core value and the company keeps emphasizing that “we respond to a customized customer quickly to increase customer value.” To make explicit this core value, SaveCom held a “BI camp” for the high-level managers to link the relationships between the BI proactive mechanism and agile customer response and the firm’s service processes. This is indicated by the manager of the technical department:

“I think that the BI camp is really nice because you know what our core value is! Based on this, we make a decision very quickly! Well, this also forms part of the core value since you use the term ‘customization’ meaning that regardless of our standard operating procedures (SOPs) and our products, everything is to be very flexible!”

4.1.3 Summaries of BI-Enabled Belief System Transformation

After the introduction of BI, SaveCom employed the concept of proactivity and created a new value creation credo. Apparently, the introduction of BI can induce companies to redefine the direction for organization, from passive to proactive initiatives in order to understand the value creation process. Also, the BI system enables them to shape the company's services strategy within which the strategic objectives and value creation process can be aligned, so that strategy can more likely be implemented. SaveCom positions itself to rapidly respond to their customers and induces the customer-centric orientation core value. Table 2 summarizes the key IT features, BI-enabled belief system transformation, and the implications of how to provide momentum and guidance to opportunity-seeking behavior.

Table 2: Summary of the BI-Enabled Belief System Transformations

Key IT Features as Driving Forces for the Transformation	BI-Enabled Belief Transformation		Implications to the Organizational MCS Design
	Direct Effects	Induced Effects	
BI highly integrates the intelligence across the enterprise.	BI enables the new customer orientation value creation process.	BI induces the introduction of new business credo for beliefs systems.	The introduction of BI can facilitate companies to understand the value creation process, the strategic objectives, and the value creation process can be aligned.
BI is highly agile and integrates the information across the enterprise.	BI enables quick response to customer needs.	BI induces the introduction of the customer-centric orientation of core value for beliefs systems.	The introduction of BI can facilitate the companies to understand the customer-centric orientation core value and to improve interaction with customers and be able to respond quickly to customer needs.

4.2 BI-Enabled Boundary Systems Transformation

BI also impacts the firm’s boundary systems. Boundary systems frame the strategic domain and define the limits of freedom. In company’s early history, SaveCom was obsessed with automation systems services technology research and development. SaveCom even neglected the market positioning strategy and the company's most important strategic objective was "survival".

4.2.1 BI Enhances Formal Organizational Control

In 2004, when the company's business conquered the technical barriers and was showing improvement, the GM realized that the company's operational management also needed to have appropriate limitations in order to pursue higher operating efficiency. However, SaveCom’s salesman had been authorized too much freedom in the past and the company’s SOPs were considered bureaucratic. The sales manager noted:

“When our company was getting bigger, so was the scale of operation. We have to use formal systems for our management....But once you use formal controls, personal flexibility will be lessened!”

BI has the capability to enable formal measurement to see how plans, financial reports, and key performance indicators (KPI) can help manage performance across all data sources, and thus, BI can enable organizational formal controls. Accordingly, when developing BI, SaveCom also aimed to establish clearer operational rules for their employees to follow. For example, by using BI, SaveCom discovered a very important fact about their customer churn rate: the less usage, the greater the turnover rate. Under this circumstance, the efforts to increase customers in this particular segmentation were vain and essentially a waste of the firm's resources. With this finding, SaveCom repositioned their target customers to focus on the low churn-rate customers and aimed to provide better services. Accordingly, the GM made a critical decision: if there was no special reason for having certain under-utilization customers, the sales were only empowered to accept customers whose bill would be higher than \$500 U.S. per month. Therefore, when the requirement of formal organizational control was increased, BI influenced the employees' cognitive levels and induced the psychological limitation for employees in providing the concept of boundaries. As the manager of the technical department indicated:

"The GM showed us the data about average revenue per user (APRU). He then drew a border line and asked us not to cross the border line. These rules are of critical importance to us. Now, before taking action, we have to show the return of our investments and communicate with real numbers."

4.2.2 BI Delivers Trusted Information

By helping organizations discover what data is spread across the enterprise, SaveCom's BI can provide a range of benefits, including increasing operational efficiency, eliminating and streamlining duplicate processes, and becoming more responsive to customer demand. The marketing manager noted:

"Salesmen are getting smart and learning to sit at the office and use data! BI helps us to be clear about our strategic objective and identify who our target customers are."

Accordingly, the BI system delivers trusted information throughout the enterprise and enables the alignment between resource allocations and business development. Based on the analytical information, salesmen have a concrete contribution to the long-term business customers and, in turn, to create greater performance. In addition, since BI enables the rational understanding of what drives the numbers, BI induces the legitimacy for changing the limitation for the boundary system. For example, before using BI, normally it would take 3 to 6 months for the salesmen to adjust to meet the new regulations. After adopting the BI system, the exclusion of the new policy has improved significantly.

4.2.3 Summary of the BI-Enabled Boundary System Transformation

By using BI, SaveCom facilitates the rational understanding of what drives the numbers and realizes that they should not focus on "under-utilization" customers, but "utilized" customers and the company provides better services and creates high customer values. Also, BI identifies the directions and induces the reconfiguration of empowerment, which limits the authorization for the operations staff, providing a clear boundary. Overall, BI deployment for boundary changes provided a rational basis and legitimacy, which can reduce the operational risk caused by the lack of consensus on the boundaries. Table 3 summarizes the key IT features, BI-enabled boundary system transformation, and the implications of how to allow individual creativity within defined limits of freedom.

Table 3: Summary of the BI-Enabled Boundary System Transformation

Key IT Features as Driving Forces for the Transformation	BI-Enabled MCS Transformation		Implications to the Organizational MCS Design
	Direct Effects	Induced Effect	
BI can make formal measurement and help manage performance.	BI enables the organizational controls.	BI provides the rational thought to confine the psychological limitation for the boundary system.	The introduction of BI can change the firm's decision-making process and provide a shift from an experience-based mode to a rational-based mode.
BI can deliver the trusted information.	BI enables the alignment between resource allocations and business development.	BI induces the legitimacy for changing the limitation for the boundary system.	BI benefits high-level management with a more rational and effective management methodology and provides a rational basis and legitimacy, which can reduce the operational risk caused by the lack of consensus on the boundaries.

4.3 BI-Enabled Diagnostic Control Systems Transformation

Just like other companies, SaveCom has a mechanism (e.g., weekly meeting, monthly meeting, quarterly meeting, and annual meeting) to monitoring the firm's regular operation and to ensure that business objectives can be achieved. The monthly meeting focuses on examining the variances between forecast and actual numbers and the directions to be amended. The quarterly meeting facilitates the cross-functional collaboration and communicates the firm's strategic objectives.

4.3.1 BI Delivers Self-Service Reports and Analysis

Before the implementation of BI, the sales department needed time to send the request and collect information from technical support departments before any action could be taken. BI puts tools in a manager's hands, allowing the manager to immediately share the required information. This in turn, enables managers to monitor the performance measures, which are important to SaveCom on a daily basis. SaveCom's employees can easily generate any information they need by themselves, as mentioned by the manager of one of district sales departments:

"Based on BI, we can work on data mining by ourselves and the information is highly related to our district. In fact, it contributes to our daily and weekly operations. So, in contrast to before, I think we can actually control the whole situation."

Apparently, BI facilitates the act of delivering self-service reporting and analysis, and enables the review of the measures within SaveCom on a real-time basis. Moreover, such real-time review within SaveCom has induced in-time remedial action.

4.3.2 BI Explores the Unrealized Opportunities and Trend

In the telecom service industry, reducing customer turnover is of critical importance to the firm's success. SaveCom's "customer care" uses existing customer data, analyzes customer preference, plans the customer retention strategy and builds churn forecast mechanisms. BI also has the capability of exploring the unrealized opportunities and trends and enables the identification of the new associations of key performance variables. The GM noted that:

"If we sell at a higher price and our competitors emerge, our customers will leave us. We all agree that the turnover customers are price-sensitive. But, surprisingly, the BI system shows that the retained customers also bring a higher profit margin. We, including myself and the sales managers, are shaken by this finding. Why? I think it is because we offer a lower price and attract our customers to use more of our products and this leads to a higher profit margin!"

Furthermore, SaveCom has used BI to explore the key characteristics of turnover customers and induces the new rules for further operation. For example, since SaveCom finds that the retained customers also bring higher profit margins, SaveCom reconsidered their customer strategy and now aims to focus on target customers and providing better customer values. These new findings of key performance variables give SaveCom many insights in operating their business.

4.3.3 Summary of the BI-Enabled DCS Transformation

BI provides the tools necessary to feed the results back to the individuals most able to effect positive change based on the new information. In the annual plan, the manager of the sales department will carefully consider where the numbers originate. It can be determined that SaveCom uses BI to identify trends or to discover previously unknown relationships that provide the company with the capability to better understand their customers and the inter-relationships of organizational performance and external factors. Accordingly, BI helps to reveal the new rules of key performance variables. BI facilitates the ability to see trends before they become problems and presents management with the ability to predict performance and make adjustments to achieve better results. Table 4 summarizes the key IT features, BI-enabled DCS transformation, and the implications of how to provide motivation, resources, and information to ensure that important organizational strategies and goals will be achieved.

Table 4: Summary of the BI-Enabled DCS Transformation

Key IT Features as Driving Forces for the Transformation	BI-Enabled MCS Transformation		Implications to the Organizational MCS Design
	Direct Effects	Induced Effect	
BI can deliver self-service reporting and analysis.	BI enables the review of measures on a real-time basis.	BI induces the in-time remedial actions and better performance management.	The implementation of BI can contribute to the business operation significantly by monitoring the performance measures on a daily basis and in-time remedial action can be taken immediately.
BI can explore the unrealized opportunities and trends.	BI enables the exploration of new critical performance variables.	BI induces the identification of new associations of key performance variables.	The implementation of BI can contribute to spot trends, to see a business from a variety of dimensions, and to focus on target customers and provide better customer values.

4.4 BI-Enabled the Interactive Control Systems Transformation

Interactive control systems are used to regularly and personally involve firms' managers in the decisional activities of subordinates. In the telecomm industry, the "rapid response to customer needs" and "innovative new service" are two of the most important sources for competitive advantages. Before the adoption of BI, SaveCom used the most conventional way (a daily meeting) to coordinate the front-line operational staff and top management.

4.4.1 BI Delivers Integrated, Accurate, and Timely Data

BI has the capability of delivering integrated, accurate, and timely data, which helps to connect people responsively with information in an easy-to-use way so they can make better decisions. Just as the GM noted in an interview on the BI system:

"The impacts of BI to SaveCom are comprehensive. By using a metaphor, it is just like the vascular system of the human body to transmit the required nutrients. The information is the general nutrient and the BI system rapidly delivers information to the hands of those who need it for an accurate response to customer- and market-demand."

The quick interaction of BI not only reflects the real-time customer behavior patterns, but also enables managers to explain the meaning of the information in a timely manner. This is of critical importance to telecom services; providing the real understanding of why customers change, reducing the risk of the customer churn-rate significantly.

4.4.2 BI Takes Action Across an Organizational Border

The BI system not only becomes a platform for knowledge sharing for customers and partners, but it also enables SaveCom's core services by providing collaborative partnerships to enhance operational efficiency. In fact, besides the sales department, SaveCom provides an "external salesman" mechanism for acquiring new business from collaborative hardware vendors. Accordingly, it is very important for business to provide SaveCom's information to their external partners, especially for

those external salesmen. By using BI, the information goes across the organizational border and enhances the transparency of data. For example, external salesmen can check bonus and customer status from the BI system from outside SaveCom. Accordingly, BI increases the bilateral interaction, promotes the external sale forces to endeavor to gain new business (since they can acquire useful information such as commissions), and to ascertain the status of their customers. As suggested by the deputy GM:

“BI shows that the expansion of our business has depended on these external sales forces. Now we have more information about the status of these external sales forces, and also, we can provide more information to them. The BI system enables us to acquire information promptly and it is also highly interactive. BI is a great help to enhance the transparency of data.”

4.4.3 Summary of the BI-Enabled Interactive Control Systems Transformation

By using BI, executives and managers alike can take a look at an area at any time and understand what is happening, rather than waiting for the day’s or month’s end reports to be compiled. BI is able to generate useful information for a user’s decision-making before they lose the ability to interpret the information and lose the chance to respond to the customer changes. BI induces high quality data and responses to trends and reduces strategic risks. Also, SaveCom provides better training materials, business information, and support to their external partners to make decisions in response to the data that is available to them. Table 5 summarizes the key IT features, BI-enabled interactive control systems transformation, and the implications of how to focus organizational attention on strategic uncertainties, thereby provoking the emergence of new initiative and strategies.

Table 5: Summary of the BI-Enabled Interactive Control Systems Transformation

Key IT Features as Driving Forces for the Transformation	BI-Enabled MCS Transformation		Implications for the Organizational MCS Design
	Direct Effects	Induced Effect	
BI can deliver integrated, accurate, and timely data.	BI enables connecting people responsively with information in an easy-to-use way.	BI induces higher data quality for making better decisions.	The implementation of BI can help managers who can take a look at an area at any time and understand what is happening, rather than waiting for the day’s or month’s end reports to be compiled, which in turn reduces business uncertainty and risks.
BI can facilitate taking action across organizational borders.	BI enables the transparency of data across an enterprise.	BI induces cross-organizational cooperation.	The cross-border responsive decision-making process allows managers at various organizations to make decisions in response to the data that is available to them, which in turn reduces business uncertainty and risks.

5 CONCLUSIONS

The main purpose of this research has been to seek an understanding of the transformation of the implementation of IT in terms of MCS. The research closely scrutinized the journey of a telecom company with the implementation of a BI system in conjunction with the management of the interactions of changes occurring over time. In this study, attempts to illustrate ways in which IT-enabled the MCS transformation by understanding the direct effects and the induced effects have been made. Notwithstanding the inherent limitations of a single case study, this study has derived a series of IT features and the direct and the induced effects. Furthermore, this study has identified how utilization of IT for transformation by combining insights for research works for SaveCom.

This effort makes several contributions to the study of the IT-enabled transformations. First, this study explores both the material features of IT – those hardware and software components that make them recognizable as technological artifacts as well as in the symbolic value of using those features (Leonardi, 2007). Accordingly, the study of technology-induced organizational change leads to a better understanding of the value of IT in a particular social context and the interactions between IT and the social context. Second, by demonstrating how IT enables MCS transformation, in turn to drive strategic renewal, this paper underscores the importance of organizational control systems transformation in the context of BI systems. Apparently, control is one of the most important

management functions and IT-enabled MCS transformation expands an understanding of how IT activities are aligned with an organization's strategies. Third, this study illustrated how IT provides an ability to enhance an understanding of MCS transformation in terms of IT features and their direct and induced effects. Distinguishing IT direct and induced effects is especially important for the IS field level.

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