Organization’s Performance, Customer Value and the Functional Capabilities of Information
Abstract

This study investigates how the functional capabilities of information systems, such as workforce management, innovation, and monitoring, affect the creation of customer value that leads to organizational performance. A cross-sectional field study (i.e., survey questionnaire) was conducted with 104 small- and medium-sized enterprises in the service industry in Malaysia. Results from the study suggest that information systems functional capabilities do influence the creation of customer value and ultimately organizational performance.

Keywords

- organizational performance,
- information systems functional capabilities,
- workforce capability,
- innovation capability,
- monitoring capability,
- small and medium enterprise,
- Malaysia

Related articles

View all related articles
This study investigates how the functional capabilities of information systems, such as workforce management, innovation, and monitoring, affect the creation of customer value that leads to organizational performance. A cross-sectional field study (i.e., survey questionnaire) was conducted with 104 small- and medium-sized enterprises in the service industry in Malaysia. Results from the study suggest that information systems functional capabilities do influence the creation of customer value and ultimately organizational performance.

Keywords
- organizational performance
- information systems functional capabilities
- workforce capability
- innovation capability
- monitoring capability
INTRODUCTION

The information systems (IS) are, today, a strategic tool for most organizations. The IS enables them to transfer the best practice embedded with the design of the information technology (IT), to integrate organizational business processes, and to share information across functional areas (Ehie & Madsen, 2005). While some organizations have achieved impressive benefits from their IS, others have experienced difficulties in gaining the benefits they expected. Thus, it can be said that contextual factors are one of the contributors toward IS success (Barua, Konana, Whinston, & Yin, 2004). As a consequence, IS researchers have adapted the resource based theory (Fink, 2011) and its extensions (Wheeler, 2002) to examine internal organizational factors as sources of competitive advantage. Building on this theory, some IS researchers have focused on organization-wide IS capability as a multidimensional construct that predicts an organization’s performance (Bharadwaj, 2000). There is evidence from a prior study (Wade & Hulland, 2004) that organizations might be better served if they understood the strategic value of IS functional capabilities. In addition, contextual factors intermediate or moderate the impact of IS...
capabilities on organizational outcomes (Richardson & Zmud, 2002). The value relevance of information technology investment announcements: Incorporating industry strategic IT role. In System Sciences, 2002. HICSS. Proceedings of the 35th Annual Hawaii International Conference on System Sciences (pp. 10). IEEE.

There is, however, significant progress in answering the question of the contribution of IS to organizational performance. For example, the emergence of innovative IS, such as the customer relationship management systems, tends to have an impact on organizational performance (Wang & Feng, 2012). Customer relationship management capabilities: Measurement, antecedents, and consequences. Management Decision, 50(1), 115–129. doi:10.1108/00251741211194903 [CrossRef], [Web of Science ®]

While previous studies (Bharadwaj, 2000) contribute to the understanding of an organization-wide IS capability construct that predicts the organization’s performance, the goal of this study is to investigate the organizational level routines that drives organizations toward the creation of customer value. In addition, the study assesses how effective the organizations are in using IS to support and enhance their core competencies that influence organizational performance. Therefore, the objectives of this study are, first, to identify emerging organization-wide IS functional capabilities and, second, to predict the link between IS functional capabilities and customer value that leads to organization performance. As such, this study develops and tests a model that investigates how IS functional capabilities affect customer value which, in turn, lead to organizational performance. Thus, this study contributes to the theoretical knowledge about IS capabilities by testing the contextual factors that intermediate or moderate the impact of IS capabilities on organizational outcomes. The study utilizes the survey questionnaire approach to gather the empirical evidence. Questionnaires were distributed to small and medium enterprises (SMEs) in the Malaysian services industry. SMEs were chosen as the target population as they play a very important role in the Malaysian economy, contributing more than 30% of the country’s gross domestic product (Department of Statistics Malaysia [DOSM], 2011). Retrieved from http://www.statistics.gov.my

In the following sections of this article, the theoretical background is described. This is followed by the development of a research model and hypotheses and the methodology used to gather data. Subsequently, the findings are discussed and conclusions are drawn.

LITERATURE REVIEW
LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Wheeler (2002) mentioned that the successful adoption and utilization of IS in any organization depend on their capabilities in employing IS in the organizations. One of the reasons why an organization is successful in adopting and utilizing IS, maybe because it is able to manage the capabilities embedded in the system (Grant, 1991). The resource-based theory of competitive advantage: Implications for strategy formulation. California Management Review, 33(3), 114–135. doi:10.2307/41166664

Dealing effectively with such a challenge requires more than just good ideas and extensive resources. It also requires organizational capabilities, namely “functional IS capabilities.” These capabilities, however, will only be effective when they are applied strategically, i.e., they are deployed to accomplish organizational goals (Teece, Pisano, & Shuen, 1997). Dynamic capabilities and strategic management. Strategic Management Journal, 18(7), 509–533. doi:10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

These IS functional capabilities are likely to be resourced differently in different organizations. Moreover, these IS functional capabilities are integrated and coordinated in different ways, depending on the context of each organization, including its history, people, and structural characteristics (Ravichandran & Lertwongsatien, 2005). Effect of information systems resources and capabilities on firm performance: A resource-based perspective. Journal of Management Information Systems, 21(4), 237–276.

Seeing functional IS capabilities from the perspective of the resource-based view of the organization, they represent the collective knowledge of the organization that builds into the organization’s processes (e.g., automation of workforce), procedures (e.g., online technologies that are becoming increasingly available), and systems (e.g., new decision support tools), and is embedded in informal networks, and personal relationships (Peppard & Ward, 2004). Beyond strategic information systems: Towards an IS capability. The Journal of Strategic Information Systems, 13(2), 167–194. doi:10.1016/j.jsis.2004.02.002

This collective knowledge allows organizations to initiate or respond to change. For example, the IS adopted or utilized by an organization is an increasingly important set of resources (often referred to as part of the IT infrastructure), but in the context of IS functional capabilities, the critical resources are the increasing demand for intelligence in information at executive level (i.e., IS skill and knowledge residing at the management level). Feeny and Willcocks (1998). Core IS capabilities for exploiting information technology. Sloan Management Review, 39(3), 9–21.

Viewing IS functional capabilities from the perspective of the resource-based view of the organization, they represent the collective knowledge of the organization that builds into the organization’s processes (e.g., automation of workforce), procedures (e.g., online technologies that are becoming increasingly available), and systems (e.g., new decision support tools), and is embedded in informal networks, and personal relationships (Peppard & Ward, 2004). Beyond strategic information systems: Towards an IS capability. The Journal of Strategic Information Systems, 13(2), 167–194. doi:10.1016/j.jsis.2004.02.002

This collective knowledge allows organizations to initiate or respond to change. For example, the IS adopted or utilized by an organization is an increasingly important set of resources (often referred to as part of the IT infrastructure), but in the context of IS functional capabilities, the critical resources are the increasing demand for intelligence in information at executive level (i.e., IS skill and knowledge residing at the management level). Feeny and Willcocks (1998). Core IS capabilities for exploiting information technology. Sloan Management Review, 39(3), 9–21.

There are studies that identified the antecedents (Huang, Li, & Chen, 2009). Information synergy as the catalyst between information technology capability and innovativeness: Empirical evidence from the financial service sector. Information Research- An International Electronic Journal, 14(1).

The role of IS capabilities in delivering sustainable improvements to competitive positioning. The Journal of Strategic Information Systems, 18(2), 100–116. doi:10.1016/j.jsis.2009.05.002


View all references) found that IS capability does not directly influence innovativeness. A greater number of studies (Doherty & Terry, 2009). The role of IS capabilities in delivering sustainable improvements to competitive positioning. The Journal of Strategic Information Systems, 18(2), 100–116. doi:10.1016/j.jsis.2009.05.002


View all references) presented a 17-item scale that can measure an organization’s IS capabilities. Huang et al. (2009). Information synergy as the catalyst between information technology capability and innovativeness: Empirical evidence from the financial service sector. Information Research- An International Electronic Journal, 14(1).

View all references) were found on the consequences of IS capabilities. These studies found that an organization’s ability (1) to leverage and sustain its competitive positioning (Doherty & Terry, 2009). The role of IS capabilities in delivering sustainable improvements to competitive positioning. The Journal of Strategic Information Systems, 18(2), 100–116. doi:10.1016/j.jsis.2009.05.002


View all references) were found on the consequences of IS capabilities. These studies found that an organization’s ability (1) to leverage and sustain its competitive positioning (Doherty & Terry, 2009). The role of IS capabilities in delivering sustainable improvements to competitive positioning. The Journal of Strategic Information Systems, 18(2), 100–116. doi:10.1016/j.jsis.2009.05.002


View all references), (3) to develop closer relationships between the firm and its customers (Harrigan et al., 2010). Internet technologies, ECRM capabilities, and performance benefits for SMEs: An exploratory study. International Journal of Electronic Commerce, 15(2), 7–46. doi:10.2753/JEC1086-4415150201

View all references), and (4) to integrate the firm’s resources (Kim et al., 2010). Integration of firm’s resource and capability to implement enterprise CRM: A case study of a retail bank in Korea. Decision Support Systems, 48(2), 313–322. doi:10.1016/j.dss.2009.07.006


View all references) and consequences (Doherty & Terry, 2009). The role of IS capabilities in delivering sustainable improvements to competitive positioning. The Journal of Strategic Information Systems, 18(2), 100–116. doi:10.1016/j.jsis.2009.05.002

View all references) and consequences (Doherty & Terry, 2009). The role of IS capabilities in delivering sustainable improvements to competitive positioning. The Journal of Strategic Information Systems, 18(2), 100–116. doi:10.1016/j.jsis.2009.05.002

View all references


View all references

Choosing capabilities involve routines for identifying, assessing, filtering, and reaching conclusions regarding the timing and viability of the IS. Matching capabilities involve routines for incorporating and selecting business activities to pursue identified economic opportunities that may create strategic options that have other obvious business value (e.g., cost reduction, increased customer satisfaction). Executing capabilities involve routines for reconfiguring products, services, sales channels, supply chain, etc. in a timely manner, or more simply, the firm’s ability to implement change. Lastly, assessing capability represents a firm’s routines to measure, understand, and communicate value signals in a timely manner. Teece et al. (1997). Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. doi:10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z [CrossRef], [Web of Science ®]

View all references


View all references


View all references

Asserts that the strength of each Net-Enabled Business Innovation Cycle (NEBIC) capability can vary on a continuum from weak to strong and also provides empirical measurement of net-enablement capabilities as a dynamic capability.

Extending this view of internal resources and/or capabilities to an IS environment, this study defines IS functional capabilities as an organization’s ability to mobilize and deploy IS-based resources in combination or co-present with other resources and/or capabilities within the organization (Bharadwaj, 2000). Bharadwaj, A. S. (2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly, 24*(1), 169–196. doi:10.2307/3250983 [CrossRef], [Web of Science ®]

View all references

The essence of this process is captured by the dynamic capabilities perspective that refers to the ability of an organization to achieve new forms of competitive advantage by renewing competences of the organization to achieve congruence with the changing business environment (Teece et al., 1997). Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. doi:10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z [CrossRef], [Web of Science ®]

View all references

Thus, IS functional capability is dynamic because the organization must continually build, adapt, and reconfigure internal and external competences to achieve congruence with the changing business environment. These competencies are especially vital when time-to-market and product timing are critical, the rate of technological change is rapid, and the nature of future competition and markets are difficult to determine (Teece et al., 1997). Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509–533. doi:10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z
On that note, there is reasonable evidence that unabated IS innovation will continue to be one of the factors that create greater capabilities in digital networks, computer hardware, and software for the foreseeable future. These technological forces, and the new business processes that they enable, are reshaping industries beyond any specific net-enabling initiative (e.g., internet-based sales channels), technology (e.g., enterprise resource planning [ERP], software), or business practice (e.g., online auctions) that generate value-creating strategies (Wheeler, 2002).

Moreover, the IS functional capabilities of an organization include the ability to assign and deploy IT resources, including the capacity of IT infrastructure, IS human resources and the IS-enabled intangible assets (Bharadwaj, 2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly*, 24(1), 169–196. doi:10.2307/3250983

The above discussion can be summarized as meaning that IS functional capabilities are complex, intangible, and can be quantified using a multi-dimensional factor analysis. This study concentrates on three IS functional capabilities i.e., workforce management, innovation, and monitoring capabilities, as these three are considered the major contributors of IS functional capabilities.

**HYPOTHESES DEVELOPMENT**
services. It requires the use of IT in a manner that enhances the value for the customers, usually in a way that was not thought of before. It also requires the organization to be able to anticipate what customer value is now and what it will be in the future. To fulfill these requirements, all staff must be involved in the process of investigating customer value and apply IT innovatively to satisfy that value. Consequently, this process of learning and innovating can contribute to superior performance (Flint, Larsson, & Gammelgaard, 2008). Exploring processes for customer value insights, supply chain learning, and innovation: An international study. *Journal of Business Logistics*, 29(1), 257–281. doi:10.1002/j.2158-1592.2008.tb00078.x


Therefore, the following hypothesis is offered:

H2: IS innovation capability has a positive effect on customer value.

IS monitoring capability is the extent to which the organization incorporates the use of IS as a system to assess, understand, and co-ordinate its employees’ and customers’ needs to improve organizational performance. Monitoring can be divided into passive and active monitoring. Passive monitoring involves sifting through reports to know the status of an event, while active monitoring involves actual and continuous observation of a particular event. While it was not possible to implement active monitoring around 30 years ago, it is now possible with the advancement of information and communication technologies. These technologies have not only reduced the cost of communication, but have also reduced the cost of monitoring. Consequently, the control costs of IS have also gone down. As a result, organizations are able to monitor their performance in real time. Additionally, they are able to respond to their customer needs in an orderly fashion because they are able to monitor their customers’ status better (Comuzzi, Vonk, & Grefen, 2012). Measures and mechanisms for process monitoring in evolving business networks. *Data & Knowledge Engineering*, 71(1), 1–28. doi:10.1016/j.datak.2011.07.004

Therefore, the following hypothesis is offered:

H3: IS monitoring capability has a positive effect on customer value.

Although prior IS research has examined the contributions of IS capabilities to organizational performance, the research is fragmented, and key gaps exist in the literature. The majority of previous studies have used resource-based theory to conclude that an organization’s resources are the main driver of organizational performance and argue that IS capabilities are likely to have a direct effect on organization performance (Bharadwaj, 2000). A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly*, 24(1), 169–196. doi:10.2307/3250983

Some studies posit a direct relationship between IS resources/capabilities and organizational performance, while others have questioned the direct-effect argument and emphasized that IS resources/capabilities are likely to affect organization performance only when they are deployed to create unique complementarities with other organizational resources (Melville, Kraemer, & Gurbaxani, 2004). Information technology and organizational performance: An integrative model of IT business value. *MIS Quarterly*, 28(2), 283–322.

organizational performance variables in the IS domain, as compared to the marketing domain. In that
domain, some studies have found significant relationship between the two variables. For example, Aspara
593–602. doi:10.1016/j.jbusres.2012.04.004

Aspara and Tikkanen (2013) suggested that customer value influences firm profit's growth. In another example,
combined employee, customer, and shareholder value have positive influences on organizational
management: Exploring the integration of employee, customer, and shareholder value and enterprise
doi:10.1362/026725701323366827

The positive relationship between customer value and organizational
performance, the following hypothesis is offered:

H4: Customer value has a positive effect on organizational performance.

**RESEARCH METHODOLOGY**

**INTRODUCTION**

**LITERATURE REVIEW**

**HYPOTHESES DEVELOPMENT**

**RESEARCH METHODOLOGY**

**FINDINGS**

**DISCUSSION**

**THEORETICAL IMPLICATIONS**

**MANAGERIAL IMPLICATIONS**

**LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH**

Based on the review of literature presented above, the research focused on the IS net-enabled and dynamic
capabilities of IT. *Figure 1* outlines the research model.

**FIG. 1.** Proposed research framework.

In order to collect the empirical evidence, a cross-sectional field study (i.e., survey questionnaire) was
conducted with SMEs in the service industry in the states of Selangor and Wilayah Persekutuan, as the
highest percentage of SMEs are located in these two states. The SMEs were chosen as target population
because they play a very important role in the Malaysian economy, contributing more than 30% to the
gross domestic product. The service industry was chosen as it is the largest contributor to the Malaysian
This study focuses on three sectors, namely hotels, Information, Communication and Technology (ICT), and professional companies. These three sectors were selected because they are the top three sectors that use information and communication technology extensively compared to others (Ministry of Higher Education [MOHE], 2010). Small and medium enterprises in Malaysia: Potential and prospects. Kuala Lumpur: Perpustakaan Negara Malaysia.

The list of SMEs in these three sectors was obtained from the Malaysian small and medium-sized industries (SMIs) and SMEs directory (http://www.smibusinessdirectory.com.my). For the services sector, a company is considered as a small enterprise if its sales are between 200,000 and RM 1,000,000 or have between 5 and 19 employees. Companies with sales between 1,000,000 and RM 5,000,000 or have between 20 and 50 employees are considered as a medium-sized enterprise (MOHE, 2010). Small and medium enterprises in Malaysia: Potential and prospects. Kuala Lumpur: Perpustakaan Negara Malaysia.

The target respondents were the MIS/IS/IT manager or equivalent. Based on the lists obtained, the researchers contacted every tenth organization by phone to identify the target respondent and their office address, e-mail address, and telephone number. One thousand companies were contacted and the questionnaire was posted via normal mail and e-mail to each of them. After one month, follow up calls were made to increase the response rate. However, only 104 companies returned the questionnaire (80 by post and the rest by e-mail) after three months of data collection. Of the 104 responses, the highest response rate was from hotels (46%), followed by the ICT companies (32%), and nearly 55% of the companies had been established for more than six years (Table 1).

<table>
<thead>
<tr>
<th>Table 1 Profile of Companies (n = 104)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSV</td>
</tr>
</tbody>
</table>

**Measurement Scales and Validation of Research Instrument**

The questionnaire consists of three sections. Section 1: IS capabilities (12 items), Section 2: customer value (3 items), and Section 3: organizational performance (4 items). These items were chosen as they have been previously validated in the IS literature. Moreover, these items were deemed more suitable in the Malaysian context.

In this study, IS functional capabilities are identified and defined as an organization’s ability to mobilize and deploy IS-based resources in combination or co-present with other resources and/or capabilities within the organization. As discussed previously, IS functional capabilities may be viewed from three perspectives: workforce management, innovation, and monitoring. The resource-based view of the organization and other prior studies (Ravichandran & Lertwongsatien, 2005). Effect of information systems resources and capabilities on firm performance: A resource-based perspective. Journal of Management Information Systems, 21(4), 237–276. [Taylor & Francis Online], [Web of Science ®]

and, finally, mobilizing IS as part of the organizational workforce. The 12 items are listed in Table 2. All items, except for organization performance, were measured using 5-point Likert scales on a range from (1) strongly disagree to (5) strongly agree. These items were selected for the study as they have been widely used in other studies and, therefore, would be more reliable and valid (Roberts & Grover, 2012). Leveraging information technology infrastructure to facilitate a firm’s customer agility and competitive activity: An empirical investigation. *Journal of Management Information Systems*, 28(4), 231–270. doi:10.2753/MIS0742-1222280409


This study adopts perceptual measures to assess the customer value construct that deals with an organization’s capability to assess customer’s perceived preference for and evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate a customer’s goals and purposes in a use situation (Wheeler, 2002). Wheeler, B. C. (2002). NEBIC: A dynamic capabilities theory for assessing net-enablement. *Information Systems Research*, 13(2), 125–146. doi:10.1287/isre.13.2.125.89

Three items were used to capture customer value i.e., customer buying behavior, customer satisfaction with current products/services, and customer expectation. To operationalize the organization performance construct, this study adapts the Fitzgerald, Johnston, Brignall, Silvestro, and Voss (1991). Fitzgerald, L., Johnston, R., Brignall, S., Silvestro, R., & Voss, C. (1991). Performance measurement in service business. London: CIMA.

Organization financial performance is measured by the respondent’s assessment that represents the actual level of attainment of their organization performance, using a scale of (1) “decreased tremendously” to (7) “increased tremendously.” The measure consists of four items that include return on investment, revenues, cash flow from operations, and operating profits (see Appendix for details of the items used).

### Scale Validation

This study conducts exploratory factor analysis (EFA) on all 12 items of IS functional capabilities measures to explore the possible underlying factor structure of a set of IS functional capabilities without imposing a preconceived structure on the outcome (Child, 1990). The essentials of factor analysis. London: Cassell Educational.

By performing EFA, this study is able determine the number of IS functional constructs underlying the 12 set of items. The EFA results indicate that there are three factors that emerge with eigenvalues greater than one and account for 59% of the variance (Table 2). As shown in Table 2 three items are loaded into Component 1, four items are loaded into Component 2, and five items are loaded into Component 3. Component 1 is labeled “IS monitoring capability,” Component 2 is labeled “IS
workforce capability,” while Component 3 is labeled “IS innovation capability.” Principal factor analysis (PFA) was performed to test the validity and reliability of the customer value and organizational performance constructs. The results reveal that all the items for both of these constructs have factor loading values greater than the cut-off value of 0.70. Thus, both customer value and organization performance constructs appeared to be reliable and valid.

Data Analysis

This study uses component-based SEM known as partial least squares (PLS) to assess the measurement model and the structural model. PLS is employed in this study to test prior theoretical assumptions against empirical data (i.e., confirmatory factor analysis), and thus, answers a set of interrelated research questions simultaneously through both measurement and structural models. As such, the causal relationships among all the latent constructs (that is, IS functional capabilities, customer value and organizational performance) can be predicted. (Chin, 1998). Issues and opinion on structural equation modelling. MIS Quarterly, 22(1), vii–xvi.

TABLE 3 Composite Reliability ($\rho_c$), (AVE), Square Root of AVE, and Correlations

FINDINGS

Measurement Model

As evidenced in Table 3, all constructs exhibit composite reliability values ($\rho_c$) and Cronbach alpha values greater that the minimum requirement of 0.70 (Chin, 1998). Issues and opinion on structural equation modelling. MIS Quarterly, 22(1), vii–xvi.
Hence, the parameter estimations of all constructs are accurate and achieve adequate internal consistency and reliability. The Average Variance Extracted (AVE) values of all constructs with the exception of the IS innovation capability exceeded the threshold value of 0.50. The AVE assessment is a more stringent test for convergent validity. Therefore, convergent validity is assessed based on the composite reliability value. Based on the composite reliability value the measurement model exhibit adequate convergent validity for all constructs including IS innovation capability (Fornell & Larcker, 1981). Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–59. doi:10.2307/3151312 [CrossRef] [Web of Science ®]

The square roots of AVEs (shaded values on the leading diagonals) are greater than correlations among constructs (off-diagonal values). The highest correlation between any pair of the constructs was −0.03 (i.e., between IS monitoring capabilities and organizational performance) while the lowest square root of AVE was 0.62 (i.e., IS innovation capability). In addition, as shown in Table 4, all items are loaded more highly on their own construct than on other constructs. Both these assessments suggest satisfactory discriminant validity of the measurement model.

**TABLE 4** Confirmatory Factor Analysis/Cross Loadings

### Structural Model

The PLS structural model and hypotheses were assessed by examining the path coefficients (β estimates), their significance levels (p-values), and the variance explained (R² values) for each dependent variable. As PLS makes no distributional assumptions, bootstrapping (500 samples with replacement) is used to test the statistical significance of each path coefficient (Chin, 1998). Chin, W. W. (1998). Issues and opinion on structural equation modelling. *MIS Quarterly, 22*(1), vii–xvi. [Web of Science ®]

*Figure 2* summarizes the results of the PLS analysis including path coefficients, path significances, and R² values. Results indicate that both the hypothesised path from IS workforce capability and IS monitoring capability to customer value were significant. Thus, H1 and H2 were supported. In contrast with this, IS innovative capability exhibits a significant negative effect on customer values. Taken together, all these IS functional capabilities combined to explain 34.4% of the variance in customer value, with most of the influence exerted by IS workforce capability. From the results, IS functional capabilities appear to affect customer value directly, but the impact of each of the IS capabilities dimensions is different. While IS workforce capability and IS monitoring capability have a positive direct impact on customer value, the IS innovation capabilities has negative direct impact on customer value.

**FIG. 2.** PLS analysis of the proposed structural model.

The results (*Figure 2*) suggest that organizations with high level of IS innovative capability do not contribute to customer value creation; rather, this capability hinders customer value creation. One possible explanation for the negative effect of IS innovative capability is that if organizations keep on introducing new IS, without considering how these changes affect the employees and customers, the IS capability that they possess hinders the implementation success rather than stimulating the benefits through customer
value. The hypothesized path from customer value to organizational performance emerged as significant, and explained 13.3% of the total variance in firm performance. The result indicates that customer value influences organizational performance. It appears that higher customer value and organizational performance result from the deployment and mobilization of IS resources with other resources. The result affirms that IS workforce and IS monitoring capabilities have greater positive impact of firm performance.

**Post Hoc Analysis**

During the preliminary analysis (the original model), IS workforce capability and IS innovation capability were modelled as having direct effects on customer value. However, prior studies indicate that there may exist potential complimentary factors among the IS capability factors (Araujo, 2002). IT capability and its impact on firm performance through the lens of IT intensity and growth rate. In *Americas conference on information systems (AMCIS) proceedings*, Paper 275. Retrieved from http://aisel.aisnet.org/amcis2002/275


View all references) found that IS capability has a large significant effect on organization performance; however, its influence was complemented by IT intensity. Because of the similarity of the IT intensity definition to IS innovation capability, the IS innovation capability construct used in this study may also have an interaction effect with IS workforce capabilities. Therefore, this study tests the strength of the associations of these two IS functional capabilities to observe this interaction effect on customer value. The PLS product indicator approach is applied to detect the interaction effect of IS innovation capability on the IS workforce capability and customer value relationship. The predictor, moderator, and dependent variables in this study are viewed as latent variables (i.e., constructs) which cannot be measured directly and thus, in testing the relationship between the predictor and dependent variables relating to the moderating effects, the procedure based on PLS product indicator recommended by (Chin, Marcolin, & Newsted, 2003). Chin, W. W., Marcolin, B. L., & Newsted, P. R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information Systems Research*, 14(2), 189–217. doi:10.1287/isre.14.2.189.16018 [CrossRef], [Web of Science ®]

View all references was followed. In this approach, product indicators reflecting the latent interaction variable: “workforce*innovation capability” is created and submitted to PLS for estimation using SmartPLS Version 2.01, which has the ability to estimate the new product indicator. To assess whether the main effects and interaction effect were significant, a bootstrap resampling procedure (Efron & Tibshirani, 1993). Efron, B., & Tibshirani, B. (1993). An introduction to the bootstrap. New York, NY: Chapman and Hall. [CrossRef] View all references) was performed. The resultant models are shown in Figures 3 and 4. The initial model (Figure 3) contained the simple additive model, which had a standardized beta of 0.510 from IS workforce capability to customer value and −0.234 from IS innovation capability to customer value, with a total $R^2$ of 27.5%. The two simple effects of IS workforce capability on customer value was significant and positive, while the IS innovation capability on customer value was significant and negative.

FIG. 3. Results of the main effects model.
Subsequently, the interaction effect “workforce*innovation capability” was added to the model (Figure 4). This resulted in a slight increase in the adjusted $R^2$ value to 27.7% and an interaction effect (i.e., workforce*innovation capability) of 0.326 to customer value ($p < 0.05$), which had a standardized beta of 0.228 from IS workforce capability to customer value ($p > 0.05$), and −0.344 from IS innovation capability to customer value ($p < 0.05$). These results imply that one standard deviation increase in IS innovation capability will not only impact customer value by −0.344, but it will also decrease the impact of IS workforce capability to customer value from 0.510 to 0.228. The results showed that IS innovation capability moderated the relationship between workforce capability and customer value.

Accordingly, when an organization perceives that it has a high level IS innovation capability, IS workforce is going to have a decreased impact on customer value. Further, when an organization perceives a low level of IS innovation capabilities, the IS workforce capabilities will have a greater impact on customer value. This shows that increasing IS workforce capability can significantly strengthen the rate of customer value only when IS innovation capability is lower. The beta estimates suggest the conditions under which IS innovation capability becomes a dominant factor equalling and potentially overshadowing IS workforce capability, that being for organization whose main focus is to deploy IS as an operational, administrative and/or strategic idea, practice, or object which is perceived as new by an organizational unit to improve organizational performance.

**DISCUSSION**

- **INTRODUCTION**
- **LITERATURE REVIEW**
- **HYPOTHESES DEVELOPMENT**
- **RESEARCH METHODOLOGY**
- **FINDINGS**
- **DISCUSSION**
- **THEORETICAL IMPLICATIONS**
- **MANAGERIAL IMPLICATIONS**
- **LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH**
The results of this study demonstrate that IS functional capabilities play an important role in customer value creation, which in turn impact organizational performance. Most important is that more consideration should be given to the potential role of the IS functional capabilities as moderating variables. The influence of IS workforce capability on customers is strongly supported ($p < 0.01$), demonstrating that IS workforce capability can be used to improve workforce efficiency and effectiveness (more employees are telecommuting, using video-conferencing and automation) which in turn, leads to improved customer value.

This result illustrates the distinct and important roles of the workforce (members of the organization) in mobilizing and deploying IS/IT to gain competitive advantage. Consequently, this capability is one of the salient mechanisms for creating and enhancing customer value, which enables an organization to achieve its objectives of customer satisfaction and loyalty, as stated by Melville et al. (2004). Information technology and organizational performance: An integrative model of IT business value. *MIS Quarterly*, 28(2), 283–322. [Web of Science ®] View all references and Barua et al. (2004). An empirical investigation of net-enabled business value. *MIS Quarterly*, 28(4), 585–620. [Web of Science ®] View all references. For example, the extended reach and increased richness of electronic interactions (such as the use of videoconferencing and automation) may enable organizations to provide better services to customers, as mentioned by Wheeler (2002). NEBIC: A dynamic capabilities theory for assessing net-enablement. *Information Systems Research*, 13(2), 125–146. doi:10.1287/isre.13.2.125.89 [CrossRef], [Web of Science ®] View all references.

The results strongly support the relationship between IS monitoring capabilities ($p < 0.01$) and customer value. The result demonstrates that when organizations are able to develop a higher-order resource such as IS monitoring capabilities from the IT infrastructure; there is a positive impact on customer value related to customer expectations and customer satisfaction. The acquisition of IS, such as hardware and network infrastructure, that enable all aspects of electronic interactions between the organization and employees and customers is necessary to create customer value. The result indicates that an organization that mobilizes and utilizes IS resources in their procedures and practices will create customer value, which in turn, will impact the organizational performance. In addition, having an IS that allows monitoring of customer behavior facilitates the organization’s daily task and routine to further advance along the current trends in the business environment. This aspect ultimately leads them to be IS enabled, thus creating customer value (Wheeler, 2002). NEBIC: A dynamic capabilities theory for assessing net-enablement. *Information Systems Research*, 13(2), 125–146. doi:10.1287/isre.13.2.125.89 [CrossRef], [Web of Science ®] View all references.

Contrary to the expectations of this study, the direct impact of IS innovation capability on customer value is significant but negative. This result contradicts much past research (Nasution & Mavondo, 2008). Organisational capabilities: Antecedents and implications for customer value. *European Journal of Marketing*, 42(3/4), 477–501. doi:10.1108/03090560810853020 [CrossRef], [Web of Science ®] View all references. As normally innovation capability would be positively correlated with customer value (the higher the level of innovation, the higher would be the customer value). To explain this unexpected result, IS innovation is a complex undertaking involving large-scale changes in deeply entrenched inter-organizational processes and systems (Davis, 1993). User acceptance of information technology: System characteristics, user perceptions, and behavioral impacts. *International Journal of Man-Machine Studies*, 38, 475–487. doi:10.1006/imms.1993.1022 [CrossRef], [Web of Science ®] View all references. The unique challenges of IS innovation include changes that organizations have to make in their business processes, perceived threats, and the organization’s own internal resistance to change. Furthermore, according to Barua et al. (2004). An empirical investigation of net-enabled business value. *MIS Quarterly*, 28(4), 585–620. [Web of Science ®] View all references.
complete use of new IS may not be achieved rapidly since organizations often run parallel online and offline transactions, duplicating efforts similar to those found in the early phase of IS adoption. Other plausible explanations for this negative effect could be that the basic system that was available was unable to deliver their requirements, for example, able to understand customer behavior and their expectations of future products (Araujo, 2002). IT capability and its impact on firm performance through the lens of its intensity and growth rate. In Americas conference on information systems (AMCIS) proceedings, Paper 275. Retrieved from http://aisel.aisnet.org/amcis2002/275

The negative effect of IS innovation capability on customer value could also be due to the fact that an SME’s IS innovation capability is a radical innovation. In a radical innovation, it will take SMEs more time to be more flexible and opportunistic. Therefore, rather than the usage of IS creating customer values, it destroys business competencies. In this case, when SMEs invest in IS they are either pre-occupied with their new capability rather than making a full assessment of the risks associated with the innovation that might transform the business, particularly in relation to the readiness of their employees and customers to adopt the innovation. As such, IS innovation capability has an adverse effect on customer value.

With respect to customer value, the results strongly support the hypothesis that good customer value leads to higher organizational performance ($p < 0.01$). The result suggests that organizations with a high level of customer value have a greater tendency to influence the organizational performance, probably because the organizational performance is subject to the potential and existing customers’ participation in the buying their product and services. The findings are consistent with and confirm prior IS adoption behavior literature (Barua et al., 2004). An empirical investigation of net-enabled business value. MIS Quarterly, 28(4), 585–620.

That financial performance attributable to net enabled business transformation drives the extent to which an organization accomplishes day-to-day business activities electronically including transactions and information exchange with customers (e.g., sales, customer service) and suppliers (e.g., procurement). This study further shows that one IS functional capability, that is the IS innovation capability, did act as a situational component that moderated the relationship between IS workforce capability and customer value. The results indicated that the influence of IS workforce capability on customer value will be significant, when the organization’s IS innovation capability is lower. This finding implies that the roles of IS functional capabilities on customer value creation are different for organizations with high or low IS innovation capability. Further, the finding illustrates the significant impact that IS workforce capability, resulting from perceived IS innovation capability, can have on determining the organization’s creation of customer value.

THEORETICAL IMPLICATIONS
It was concluded that this study makes two important theoretical contributions. First, the authors contribute to the IS net-enabled and dynamic capabilities of IT literature by uncovering three important IS functional capabilities that have not received much attention in previous research and show how these capabilities leverage customer value, and turn it into organizational performance, in contrast to the focus in prior work on how IT assets (e.g., IT investments, IT applications) affect various measures of organizational performance (e.g., Dewan, Shi, & Gurbaxani, 2007). Investigating the risk-return relationship of information technology investment: Firm-level empirical analysis. *Management Science*, 53(12), 1829–1842. doi:10.1287/mnsc.1070.0739 [CrossRef], [Web of Science ®](View all references). This study enhances understanding of the nature of IS functional capabilities and how they can create customer value, thus leading to an organization’s competitive success. The conceptual expansion of IS functional capabilities can enrich the development of further research ideas. Second, this study complements prior literature by drawing attention to the interaction between IS functional capabilities that may weaken some of those capabilities. This study provides the first empirical test of this conjecture and shows that IS functional capabilities are foundational capabilities that enhance or hinder other IS functional capabilities, which in turn affect customer value and organizational performance.

While most past studies attempted to understand how to use IT to leverage an organization’s performance as well as the relationship between IT and various organizational output variables, this study initially explores the dynamic IS functional capabilities (i.e., workforce, innovation, and monitoring) that may exist in organizations due to the deployment and investment of IT resources within their organization. In addition, this study examines the roles of these IS functional capabilities as antecedents of customer value (customer satisfaction) that subsequently has an impact on the organization’s performance (liquidity, capital structure, earning, and market ratio). Hence, a theoretical conceptualization of IS functional capabilities constructs as the locus of IT-enabled organizational transformation can serve as an alternative for the common understanding of this research construct. Through the theoretical development, the central, yet fragmented, theoretical perspectives in the literature, such as Resource Based View (RBV), and process innovation are consolidated to build a more comprehensive perspective on organizational IT impacts, and thus provide a theoretical foundation for further empirical studies.

**MANAGERIAL IMPLICATIONS**

The study reports that IS functional capabilities are important in determining customer value and an organization’s performance, given that IS workforce capability explained the highest variation in customer value, followed by IS monitoring capability. Therefore, in terms of practical contributions, this study offers guidance for organizations to focus more strategically and selectively on their functional IS workforce capability in order to create customer value effectively. When organizations decide to invest in certain IS, they need to implement IS that enable employees to deploy the new IS in their daily routines and/or tasks. As such, training should be organized on the proper use of the new IS so that the employees...
have the appropriate skills and knowledge of the systems. With the appropriate skills and knowledge, the employees will have the confidence to use the new IS, leading to high workforce capability, whereby they are able to provide effective and efficient services to customers.

On the other hand, the findings of this study reveal that IS innovation capability has a negative association with customer value. The findings also reveal that organizations with a high level of IS innovation capability will potentially affect the impact of IS workforce capability on customer value. Thus, depending on their organization situations, organizations should balance the IS innovation capability and IS workforce capability to ensure that the customer value is retained. In this context, a combined workforce-innovation strategy may work best. Organizations could look internally, by instilling proper values and norms in the employees to increase significantly the rate of retention among employees of the organizational change made.

Furthermore, before the new system is fully implemented by organizations, adequate information of the new systems should be communicated to the employees so that they are aware of the new systems. This awareness of the significance of the new IS in assisting employees in their daily tasks would make them more receptive toward IS innovation capability. Externally, organizations need to collect more information about their customers’ need for, behavior toward and knowledge of IS before the latest IS is introduced to the customer. It should be noted that the significant but negative relationship between innovation capability and customer value warrants further investigation as this finding contradicts previous findings.

LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

As with any empirical study, this study has limitations. First, since the study focused on IS functional capabilities, future work should include other constructs such as marketing capability, financial capability, and so on. Apart from identifying other constructs of IS functional capabilities, future work should include testing the IS functional capability variables as a second-order construct with several formative dimensions. Hall (1993). A framework linking intangible resources and capabilities to sustainable competitive advantage. Strategic Management Journal, 14, 607–618.

doi:10.1002/smj.4250140804 [CrossRef], [Web of Science ®]

View all references (Hall, R. A. (1993). A framework linking intangible resources and capabilities to sustainable competitive advantage. Strategic Management Journal, 14, 607–618.) argues that capabilities, particularly, operational capabilities are the firms’ processes and resources that assist firm to do more and better than their competitors. In future, IS functional capabilities can be redefined as the processes that reconfigure a firm’s resources and operational routines in the manner envisioned and deemed appropriate by the principal decision makers of the firms (Cepeda & Vera, 2007. Cepeda, G., & Vera, D. (2007). Dynamic capabilities and operational capabilities: A knowledge management perspective. Journal of Business Research, 60, 426–437.

doi:10.1016/j.jbusres.2007.01.013 [CrossRef], [Web of Science ®]

View all references (Cepeda, G., & Vera, D. (2007). Dynamic capabilities and operational capabilities: A knowledge management perspective. Journal of Business Research, 60, 426–437.) For example, IS capabilities can be refer to as hypothetical actions that firms are likely to reply based on some general notion of IS functional capability instead of specific actions.
Therefore, the conceptualization of IS functional capabilities constitutes a list of different areas where the firms might possess the ability to take different kinds of actions. Therefore, the indicators that determine IS capabilities are causal indicators, and as such a formative measurement model might be more applicable (Diamantopoulos & Siguaw, 2006). Formative versus reflective indicators in organizational measure development: A comparison and empirical illustration. *British Journal of Management, 17*, 263–282. doi:10.1111/j.1467-8551.2006.00500.x

Extending this study to test the IS capabilities construct as a formative second order construct may reveals certain fundamental assumptions about the scales measuring multidimensional constructs such as IS functional capabilities to assure the validity of the results.

Second, this study relies on self-reporting by key respondents—the MIS/IS/IT manager or equivalent. While these respondents are likely to be in the best position to answer questions about IS functional capabilities, customer value and organizational performance, other managers may have different, equally valid perspectives. Third, the study focuses only on financial organizational performance, which limits the vast variations of performance that can be assessed in organizations. Future research should focus on different components of performance measures based on the balance-scored card, whereby different dimensions of performance have been proposed. In addition, as with IS functional capabilities, the performance variables should also be measured in second order formative models. Organizational performance can be an example of a formative construct when it is operationalized using one measure each for profitability, productivity, and market share. If, in the future, a researcher is interested in capturing additional aspects of organizational performance, the a second order formative construct for organizational performance should be designed to tap to tap into the different subconstructs. At the same time ensure that multicollinearity is safeguarded by ensuring that the items do not tap into the same aspects (Petter, Straub, & Arun, 2007).

Lastly, the sample size is relatively small compared to the actual population, despite numerous efforts made to increase the response rates. The study focused on one cultural setting (Malaysia) and selected industry (hotels, ICT, professionals, and retail). Hence, the findings may not be generalizable beyond these contexts. Future research should include other industries. Although there are limitations, the empirical results presented here have added to the existing empirical evidence.

**APPENDIX: QUESTIONNAIRE ITEMS**

Please tick in the place that best describes the business activities, processes, and practice in your organization (1—strongly disagree to 7—strongly agree).

Table

<table>
<thead>
<tr>
<th>Business Activities, Processes, and Practice</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

Please tick in the place that best describes the customer value creation in your organization.

Table

<table>
<thead>
<tr>
<th>Customer Value Creation</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
</table>

Please state the actual level of attainment for the following performance in your company for the past 12 months (1—Decreased tremendously to 7—Increased tremendously).
REFERENCES


---

**Article metrics**

- **Views:** 234

**Article metrics information**

**Users also read**

- Delineating IT Resources and Capabilities to Obtain Competitive Advantage and Improve Firm Performance
  Rafi Ashrafi, et al.
Volume 32, Issue 1, 2015

- Examining the Success of the Online Public Grievance Redressal

Librarians

- Librarians' area
- Pricing
- Institutional account
- Access entitlements
- Co-branding
- IP ranges
- Link resolver preferences
- Usage reports

Authors & Editors

- Book authors
- Journal authors
- Reference work authors
- Editors

Societies

- Current partners
- Publish with us

Help & Information

- Help
- FAQs
- Contact us
- Press releases
- Commercial services

Taylor & Francis Group

- Taylor & Francis
- Routledge
- Psychology Press
- CRC Press
- Garland Science