8-5-2011

Developing Sustainable IT-Related Capabilities: Instrument Development and Test

Acklesh Prasad
School of Accounting and Finance The University of the South Pacific Suva, FIJI, prasad_ac@usp.ac.fj

Peter Green
UQ Business School The University of Queensland Brisbane, QLD, Australia, p.green@business.uq.edu.au

Jon Heales
UQ Business School The University of Queensland Brisbane, QLD, Australia, j.heales@business.uq.edu.au

Developing Sustainable IT-Related Capabilities: Instrument Development and Test

Acklesh Prasad
School of Accounting and Finance
The University of the South Pacific
Suva, FIJI
prasad_ac@usp.ac.fj

Peter Green
UQ Business School
The University of Queensland
Brisbane, QLD, Australia
p.green@business.uq.edu.au

Jon Heales
UQ Business School
The University of Queensland
Brisbane, QLD, Australia
j.heales@business.uq.edu.au

ABSTRACT

Research has established that firms' IT-related capabilities at a point in time explain IT-related performance differences across firms. IT resources, however, are dynamic, and evolve at an exponential rate. This means we need to understand how to sustain firms' existing capabilities to leverage opportunities offered by new IT resources. Wet suggests a higher-level resource that can sustain firms' existing IT-related capabilities. Second, we report on the development of a valid and reliable measurement instrument for measuring this higher-level resource in four stages, which includes expert feedback and a field test. The validated instrument would be useful in extending the IT business value studies to investigate how firms can sustain their IT-related capabilities. This effort will provide a deeper understanding of how firms can secure sustainable IT-related business value from their acquired IT resources.

Keywords

Business value, sustainable IT-related capabilities, complementarity theory, resource- based view, dynamic capabilities, instrument development

INTRODUCTION

Understanding ways to leverage better business value from IT investments is an on-going major challenge faced by the IT investors. Business value considers performance impacts at various organizational levels (e.g., processes and firm levels). Intense research efforts consider how IT resources can contribute to business value. The strategic necessity hypothesis suggests the importance of IT in organizations (Powell and Dent-Micelle, 1997). Firms, however, cannot expect IT to provide a sustainable advantage because IT is readily available to all firms in competitive markets. Rather, the way firms uniquely leverage their IT resources determines the extent to which IT can contribute to business value. Current IT business value research suggests the firm's IT-related capabilities explain IT-related performance differences across firms (Powell and Den-Micelle, 1997). IT-related capabilities are organizations' unique IT know-how, inimitable over a period (Clemons and Row, 1991). This suggestion means research considers firm's IT-related capabilities at a point in time. IT resources, however, evolve at a rapid pace. Firms can sustain their IT-related business value from the evolving IT if their IT-related capabilities are sustainable. Sustainable IT-related capabilities can capitalize on emerging IT-related opportunities. Therefore, firms not only need to develop IT-related capabilities, but also sustain their IT-related capabilities. This task requires an understanding of the environment that allows firms to recognize and capitalize on emerging IT-related opportunities.

Organisations can renew their competencies (IT-related capabilities) through innovative responses by appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competencies (Teece, Pisano and Shuen, 1997). Firms will need to follow a certain trajectory of competence development, which is best achieved internally to organise certain types of economic activities in ways that are difficult to mimic (Coase, 1937; Teece et al.,

1997). Competencies and capabilities exist in organizational processes and structures and their interaction develops complementary factors that explain the essence of the firm's dynamic capabilities and competitive advantage (Teece et al., 1997). That is, these processes have a high level of coherence within themselves. This coherence generates additional capabilities that are difficult to replicate because of their unique cohesive set of intra-organizational linkages. The result of this strategy is a unique higher-level dynamic resource formed from an integration of more specialized capabilities (Grant, 2008). This resource is a dynamic complementary resource because it has the ability to integrate, build, and reconfigure internal and external competencies to better address rapidly changing environments (Teece et al., 1997). We suggest that four such resources: a decentralized task-allocation organization design, a decentralized team-oriented organization design, a congruent reward system, and a lateral IT governance structure, can form a higher-level dynamic capability. We name this capability an IT-Usage Platform.

The Business Value Complementarity (BVC), Resource-Based View of the Firm (RBV) and the Dynamic Capabilities (DC) theoretical foundations are the basis for suggesting relationships between organizational resources and business value. One theoretical foundation, the RBV suggest the resources that could be IT-related capabilities, but attracts criticism as it does not suggest how the IT-related capabilities help leverage IT-related business value (Teece, 2007; Teece et al., 1997). The dynamic capabilities framework progresses our understanding of this aspect. To the best of our knowledge, research has not yet demonstrated how the dynamic capabilities framework informs how to sustain the IT-related capabilities and how these sustainable IT-related capabilities relate to business value. One of the reasons for this disparity is the lack of understanding on potential higher-level dynamic resources and ways to measure these resources in organizations.

The aim of this paper is to report on, and discuss, the development of a measurement instrument that captures four organizational resources that co-create a higher-level dynamic capability. We suggest that this dynamic capability can help sustain firm's existing IT-related capabilities. Developing and validating reliable measurement instruments for theoretical concepts is important if we want to obtain empirical evidence to test our theories. Proper validation of measurement instruments is an important phase in IS empirical research. The rest of this paper progresses as follows. The next section introduces the main concepts of dynamic capabilities theory and explains how the suggested four resources co-create a dynamic capability of IT-Usage Platform. The following section provides a detailed discussion on the procedure used to develop the measurement instrument. This work includes a discussion on the confirmatory field study and associated statistical analysis used to establish the validity and reliability of the measurement instrument. The paper concludes with a summary of the contributions and some directions for future research.

BACKGROUND AND THEORY

IS research considers the RBV perspective to suggest that firms have bundles of resources. The RBV perspective suggests that firms possess resources, including IT resources and their complementarities. A subset of these resources enables firms to achieve competitive advantage and a further subset leads to superior long-term performance (Barney, 1991). IT resources rarely have a direct influence on sustained business performance. Rather, information systems exert their influence on firms with a complementary relationship with other assets and capabilities (Clemons and Row, 1991). Competitive advantage, however, depends on a firm's superior deployment of capabilities. This situation occurs because these capabilities are embedded in a firm, and they are difficult to trade (Teece et al., 1997). The RBV perspective recognizes that firms have capabilities, but it does not attempt to explain the nature of the isolating mechanisms that allow for these capabilities to be sustained (Teece et al., 1997). Understanding the factors that develop and enhance the firms' capabilities ensures that firms' capabilities are intact in an increasingly demanding competitive environment. This competitive environment means that firms have to have a strategy of continuous investment in IT. The result of this requirement is that firms acquire new resources that present the opportunity to sustain their existing competitive advantage.

Organizations have a set of resources that can sustain firms' existing capabilities (dynamic capabilities) (Teece, 2007; Teece et al., 1997). These resources are difficult to imitate, as they are combinations of organizational, functional and technological skills. They establish the foundations upon which distinctive and difficult to imitate advantages can be built, maintained and enhanced (Teece et al., 1997). A firm's capacity to renew their competencies is through their innovative responses. These responses include appropriately adapting, integrating and reconfiguring internal and external organizational skills, resources, and functional competencies. The resultant product will ensure that firms sustain their performance advantage (Teece et al., 1997). This study suggests four complementary resources that co-create a dynamic environment we term the IT-Usage platform.

A Lateral-Based IT Governance Structure

IT Governance, focusing on information and IT assets, specifies the decision rights and accountability framework to encourage desirable behavior in the use of IT (Weill and Ross, 2004). IT governance also includes foundational mechanisms in the form of the leadership, and the organizational structures and processes that ensure that the organizations' IT sustains and extends its strategies and objectives (IT Governance Institute, 2007). IT governance is an IT-related decision-making structure and method to plan, organise, and control IT activities, and the most prominent of these structures is the IT steering committees (Karimi, Bhattacherjee, Gupta and Somers, 2000). The IT steering committee is a lateral IT governance structure with a key role in policy setting and organization-wide coordination of IT resources (Karimi et al., 2000). The IT steering committee consists of a high-level team of representatives from multiple divisions or functions. The committee is entrusted with the task of linking IT strategy with business strategy by setting the strategic direction, matching corporate concerns with technological potential, and building commitment to policies (IT Governance Institute, 2007). Chaired by a top executive, and staffed by both IT and business personnel, IT steering committees meet periodically to discuss IT direction, approve and rank projects, review performance, formulate or approve technology policies, determine resource levels, and recommend major initiatives (Earl, 1993). A successful IT governance vehicle requires communication amongst all parties based on constructive relationships (Bowen, Chung and Rohde, 2007; Johnson and Lederer, 2005). This aspect is an essential characteristic in the constitution of the IT steering committee.

Human Resource Related Organizational Design – Task

Human resources management (HRM) practices can help create a source of sustained performance advantage in organizations (Huselid, 1995). More effective HRM systems are ones that simultaneously exploit the potential for complementarities and synergies among the HRM practices (Becker and Gerhart, 1996; Huselid, 1995). A firm's employees provide a unique source of capability that may be highly inimitable, leading to sustainable competitive advantage. The extent to which a firm can sustain its HRM-related advantages is dependent upon how it capitalizes on its value-generating human resources. Organizational can elicit discretionary effort from employees through their influence over thier skills and motivation. Such efforts include having organizational structures and designs that provide employees with the ability to control how they perform their roles (Baily, 1993). Appropriate organizational design, which involves the specification of decision rights, performance evaluation systems, and compensation systems, can help in achieving better outcomes from employees (Brickly, Smith and Zimmerman, 1996; Hitt and Brynjolfsson, 1997).

Organizations possess and use many different types of information, but people have a finite ability to process and communicate this information (Hitt and Brynjolfsson, 1997). When communication is costly and centralized, and decision makers have an infinite capacity to digest information, a centralized organizational structure will economize on communication costs (Hitt and Brynjolfsson, 1997). Such a structure, however, places a heavy burden on central decision makers. Knowledge can be general or specific (Hayek, 1945). Specific knowledge is difficult to convey, and it is more costly to transfer (Jensen and Meckling, 1992). This situation arises because the 'specific feature' of knowledge is that individuals know more than they can state (Polanyi, 1966). As people have limited capacity to process information, highly specific information is likely to reside at the lower levels of organization (Hitt and Brynjolfsson, 1997). To take advantage of this specific knowledge, decision rights should be collated with necessary knowledge (Jensen and Meckling, 1992). An organizational structure where actors with specific knowledge have decision rights will ensure that the unique specific knowledge is widely communicated within the organization. This form of organizational structure is termed a decentralised organizational structure. A decentralised organizational structure puts the knowledge and the people together. Performance is broadly associated with a work system that includes a decentralised decision making authority (Brynjolfsson and Hitt, 1997). The contribution of a highly motivated workforce will be limited if jobs are structured, or programmed in such a way, that employees do not have the opportunity to use their skills to refine the way they perform their tasks (Baily, 1993).

Human Resource Related Organizational Design – Environment

A powerful feature of IT is its capacity to enable people to work efficiently in teams (Rockart and Short, 1989). IT can facilitate a move away from traditional hierarchy towards an open organization and promote a team-based structure (Powell, Lovallo and Caringal, 2006). IT tools such as e-mail and conferencing facilitate coordination within and across business units. Tying decision rights and knowledge together promotes an environment that encourages employees to interact and adopt a team-based approach. As work-based technologies become more common, organizational performance becomes increasingly affected by organizations' capacity to manage the team-based approach (Nolan and Croson, 1995). HRM practices that encourage participation amongst employees, and allow them to improve how they perform their work, can also contribute to sustained performance (Huselid, 1995). Such HRM initiatives include cross-functional teams, job rotation, and quality circles (Huselid, 1995). Thus, a decentralised form of organizational design is critical to ensure a better synergy

between the task in organizations and their human resources. Such a design provides employees with greater autonomy with their task. The decentralised structure nurtures an environment that allows participation amongst employees to improve on how they perform their tasks. A decentralised organization design and an environment that promotes sharing of skills and knowledge are human resource related organizational design issues capable of establishing a platform for the effective use of IT resources (IT-Usage platform).

Incentive Systems

A decentralised system promotes better use of operational level knowledge in organizations. Such a system can also exacerbate agency problems (Jensen and Meckling, 1992). In the absence of appropriate incentive systems, workers do not necessarily use their decision-making authority in the best interest of the firm (Hitt and Brynjolfsson, 1997). Appropriate incentive systems align the worker's goals to those of the organization. Workers seek appropriate compensation for their willingness to share knowledge. Effective sharing and leveraging of specific knowledge is only possible when an organization appropriately rewards the efforts of its employees. Complementary changes and considerations in work practices are important for improving firm productivity (Ichniowski, Shaw and Prennushi, 1997). Firms' work policies should be part of a coherent incentive system and not developed in isolation (Baker, Gibbons and Murphy, 2002; Holmstrom, 1999; Kandel and Lazear, 1992; Milgrom and Roberts, 1990; Milgrom, Roberts and March, 1995). Incentive systems based on objective performance measures can increase the effectiveness of related policies, including a shared work environment (Baker et al., 2002). Teamwork will also make group-based incentive pay more effective when firms provide workers with greater autonomy (Kandel and Lazear, 1992). A team environment is more effective when a firm adopts a set of complementary practices including employment security, flexible job assignments, skills training, and communication procedures (Milgrom et al., 1995).

The Constitution of the IT-Usage Platform

The synergy between organizational design and reward systems is important for firms' efficient use of IT resources. A laterally organized IT governance structure that adopts and sets directions for use of IT resources, an organizational design that vests decision authority to the users, and a congruent reward system sets an important platform for efficient and effective use of the IT resources. This platform recognizes the importance of the users of technology from the outset, and rewards them for their appropriate learning and sharing initiatives. The relationship between the learning, sharing, and rewarding will be recursive. The product of these recursions will be a rich pool of IT-related specific knowledge. A lateral IT governance structure will communicate this rich specific IT-related knowledge to the decision makers. The IT deployment benefits and challenges experienced at the IT-usage level is made known at the decision making level. Operational level management staff are the custodians of this specific information as they represent the end users and they will share this information at the decision making level. This specific information filters up to the lateral IT steering committee, accommodating the concerns of the end-users at the operational level of IT resource consumption. This achievement would mean that the end-users would be motivated and they would demand more value from their IT resources. The result of this coordination has a dual purpose, and it is recursive. First, the decision makers will have the current information set to use and make IT-related decisions that are most important for their organization at that point in time. Second, such IT-related decisions result in end users having access to IT resources that are most relevant for the effective and efficient operation of the business processes. The recursive process of learning and sharing of information within this IT-Usage platform is a unique dynamic capability that will ensure that firms sustain their IT-related capabilities. The suggested IT-Usage platform is more resourceful and a dynamic capability than the individual resources that constitute this platform. The IT-Usage platform will ensure that organizations identify opportunities through consistent appreciation of the importance of the end users in the IT resource utilization process. The level of cohesion between the resources that form the IT-Usage platform makes the IT-Usage platform a unique organizational capability. Figure 1 conceptualizes the IT-Usage Platform.

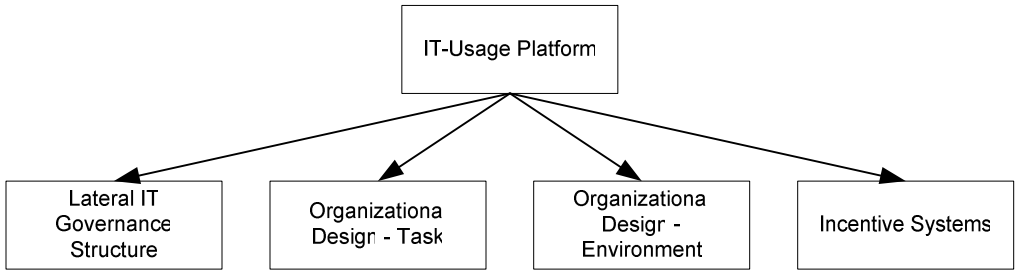

Figure 1. Conceptualization of the IT-Usage Platform

INSTRUMENT DEVELOPMENT APPROACH

We now develop and validate, in multiple stages, an instrument that measures the components of the IT-Usage Platform. Figure 2 describes the various stages of this process, which incorporates and extends the methodological procedures first described by Davies (1989) and Moore and Benbasat (1991). This process of instrument development ensures that the instrument is general enough for application in various IT business value studies.

Step 1: Item Creation

The BVC, RBV, and the dynamic capability perspectives present sound specification for the formation of a higher-level dynamic capability of IT-Usage Platform. This study considers the perceptual measures of the organizational factors because these factors are not directly observable. The potential measurement items for the constructs form a pool of candidate items. This process is necessary to ensure content validity (Moore and Benbasat, 1991). Examination of the business value and organization studies literature, and consultation with industry partners and the academics led to the generation of a pool of candidate items. Ten items per construct can achieve reliability levels of at least 0.80 (Davis, 1989). The items are not listed for brevity reasons but can be obtained from the authors.

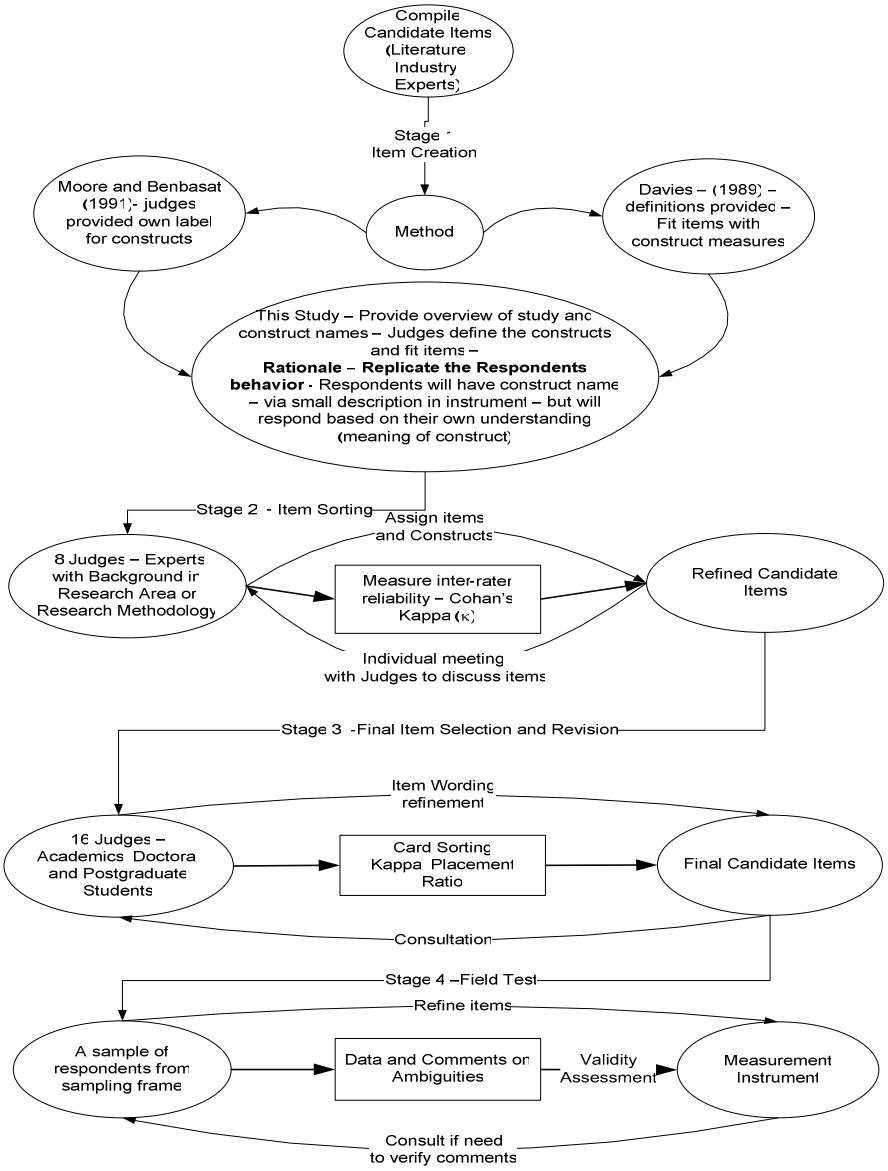

Figure 2. Instrument Development Stages

Stage 2: Item Identification

The goal of this stage was to establish initial differences in content validity between the measurement items. Eight recognized IS academics (Judges) with accomplishment in organization-related research assessed the correspondence between the pool of candidate items and the intended constructs. This approach adopted a mix of steps from Davies (Davis, 1989), and Moore and Benbasat (1991). This study provided an overview of the study and the judges were to decide on the definition of the constructs in the relevant context. The judges then related the measures to their defined constructs. This approach depicts the situation that the potential respondents would encounter when completing the research instrument. The conciseness of the research instrument means respondents have to rely on the brief descriptions to relate the measures to the context of the study. This stage of the instrument validation process depicts this environment. The judges placed tick(s) under the construct(s) to which they felt the measurement item best related. Interviews with the judges upon the evaluation of the validation document allowed them to discuss any potential conflicts and issues they had with the measures. The interviews were informal, aimed at obtaining detailed feedback on various aspects of the validation document.

Each judge corresponded more than 70% of the items with the constructs. Judges individual item correspondence to constructs ranged from 25% to 100%. We used a more robust measure, Cohen's Kappa (κ) (Cohen, 1960) for each pair of judges, to estimates their inter-rater reliability. The kappa scores indicated that the inter-rater reliability for all except one pair of judges are within the full agreement range ($\kappa = 0.60 – 0.80$) or within the almost perfect agreement ($\kappa = 0.81 – 1.00$). The excepted pair has a kappa of 0.570 (moderate agreement). The judges' correspondence evaluation responses and the outcome of their interviews formed the basis for selecting (eliminating) candidate items for the constructs. We exercised special care to ensure the remaining pool of items was representative of the constructs.

Stage 3: Final Item Selection and Revision

The purpose of this stage of the instrument development process was to revise the reduced set of candidate items to a final set of measurement items. Moore and Benbasat (1991) and Davies (1989) suggest an index-card sorting test as an appropriate procedure for this step. Sixteen judges participated in this process. Each index card contained a candidate item, and the judges sorted these cards into categories. Consecutively, four groups of judges of four members each performed this sorting exercise, with two groups knowing the categories in which the items are to be sorted (Moore and Benbasat, 1991). Item revisions at the end of each round ensured improved reliability at the end to achieve an acceptable Kappa level of 0.70 (Straub, Rai and Klein, 2004). Table 1 presents Kappa scores of each round and placement ratio summary (Moore and Benbasat, 1991). A kappa of 0.87 was reached in round 4.

	Round 1 (No Construct)	Round 2 (Construct)	Round 3 (No Construct)	Round 4 (Construct)
Placement Ratio Outcome				
Lateral IT Governance Structure	80%	100%	89%	100%
Organization Design – Task	55%	91%	63%	96%
Organization Design – Environment	46%	80%	58%	88%
Incentive Systems	59%	81%	68%	89%
Kappa Analysis				
Average Kappa between pairs of Judges	0.51	0.76	0.59	0.87

Table 1. Results of Index Card Sorting

Appendix 1 presents the final list of measurement items for the constructs. The final stage of the instrument testing process involved the conduct of the field test. However, it was necessary to construct a sampling frame before the conduct of the field test. This process was necessary because a field test should involve a sub-sample of potential respondents from the sampling frame of the main study. This precaution will also indirectly ensure that the measurement constructs achieve wider applicability. Details from the ORBIS database were used to develop an appropriate sampling frame. ORBIS is a global database, developed by Bureau van Dijk Electronic Publishing (BvDEP). The final list in the sampling frame consisted of 2493 potential respondents.

Stage 4: Field Test

The field test of the instrument was to ensure that the items measure what they intend to measure. From the sample frame of 2493 companies, 278 potential respondents received invitation to participate in the field test. Data collection for the field test was through survey research. The field test used both mail and internet surveys. The administration of the field test was consistent with the guidelines suggested by Dillman (2007). At the end, progressively, the field test survey secured fifty-six (56) valid responses, giving a response rate of 20%. Tests for non-response bias (t-test), comparison of mail and online responses (t-test), common methods variance (Herman's Single-Factor Test) (Malhotra, Kim and Patil, 2006) did not identify any issues with the data. The first step of evaluating the measurement properties of field test results was to conduct an exploratory factor analysis (EFA). The item correlations within the EFA provide an initial indication of the association between the construct measurements. An evaluation of the correlations between the measurement items revealed that the correlations were mostly significant. This result meant the data satisfied prerequisites of the exploratory factor analysis. The twenty measurement items formed four factors, and the measurement items for the constructs clustered together. There were no split factors or significant cross loadings. The factor loadings were also above or near the preferred 0.70 (Nunnally, 1978). Table 2 presents the results of the EFA.

A confirmatory factor analysis (CFA) also evaluated the measurement items. This analysis was performed with PLS, a components-based structural equation modeling (SEM) statistical technique. Table 2 provides factor loadings for this analysis. The item loading in this confirmatory approach is largely above the strict rule of thumb of 0.70 (Nunnally, 1978). All constructs have Cronbach's alpha above 0.70, and AVE above 0.50. The composite reliability for all constructs is above 0.80. Comparison of the square root of AVE and inter-construct correlations showed that the square root of AVE for each construct was higher than their inter-construct correlations. Table 3 presents this comparison. The value in bold is the square root of AVE of the construct. This outcome ensured the disciminant validity of the field test data.

	EFA Loadings				CFA Loadings			
Items	1	2	3	4	IG	OT	OE	IC
IG1	**0.89**				0.89			
IG2	**0.84**				0.71			
IG3	**0.83**				0.84			
IG4	**0.84**				0.89			
IG5	**0.87**				0.73			
IG6	**0.83**				0.91			
IG7	**0.94**				0.90			
OT1		**0.67**				0.75		
OT2		**0.87**				0.71		
OT3		**0.91**				0.72		
OT4		**0.86**				0.82		
OT5		**0.84**				0.71		
OE1			**0.67**				0.72	
OE2			**0.68**				0.77	
OE3			**0.77**				0.78	
IC1				**0.84**				0.72
IC2				**0.91**				0.73
IC3				**0.68**				0.78
IC4				**0.90**				0.86
IC5				**0.91**				0.83

Table 2. EFA and CFA Results

Note: The cross loading are not provided for brevity reasons. Detailed analysis data could be obtained from the authors.

	IG	OT	OE	IC
Lateral IT Governance Structure(IG)	**0.84**			
Organization Design – Task (OT)	0.46	**0.76**		
Organization Design – Environment (OE)	0.38	0.46	**0.73**	
Incentive Systems (IC)	0.49	0.55	0.58	**0.85**

Table 3. Square Root of AVE and Inter-Construct Correlations

DISCUSSION AND CONCLUSION

The theorizing of the higher-level dynamic resource and the instrument development exercise outlined in this paper offers several contributions. First, this study reports a rigorous process of creating and validating measurement items to measure higher-level resources than can sustain firms existing IT-related capabilities. This effort is important to understand how firms can continue to source IT-related business value from their IT resources that they continually invest in. The discussed procedure ensured high levels of confidence in developing content validity and establishing construct validity and reliability of the instrument. The EFA and CFA showed that indeed the developed measurement instrument is reliable and valid. Researchers can adopt this design to ensure strong reliability and validity in their empirical studies. This effort will be especially important in studies that may consider other forms of related resource interactions that result in higher-level dynamic capabilities.

Second, research can employ the instrument developed in this study in various settings to investigate how firms' can sustain their existing IT-related capabilities. Research can employ this instrument to investigate how sustainable IT-related management capabilities relate to internal and external process-level performance. This scenario includes middle management capability of shared organizational knowledge and top management capability of top management commitment towards IT-related initiatives. Research can also consider how the suggested IT-Usage Platform develops a flexible IT infrastructure. This effort is important because a flexible IT infrastructure can recognise opportunities better and embed them into firm's information systems. Sustainable IT-related capabilities can also influence how firms invest in emerging communication and collaborative tools. The Web 2.0 tools present enormous opportunities to businesses to improve their communication and collaboration. The extent of firms' penetration into these technologies will be contingent upon management knowledge of these technologies. Research can examine how dynamic capabilities can develop this understanding, and help in utilizing these assets to improve their business value.

Third, the IT business value literature suggests resources that are IT-related capabilities and ones that are not. It, however, does not offer suggestions on how firms can convert resources that encompass some capability-like features into their IT-related capabilities. The resultant instrument of this study provides one such higher-level resource that research can consider to examine how resources that encompass some capability-like features can be transformed into their IT-related capabilities. An example of a resource that possesses some capability-like features is technical IT skills (Mata, Fuerst and Barney, 1995).

Fourth, this paper informs on the need for well-developed and validated measurement instruments in IS research. This effort is especially important as it provides credibility to IS and strengthens the IS field. This paper suggests some insights to those intending to conduct similar evaluations to strengthen their empirical evaluations.

The instrument development effort discussed in this paper moves the IT business value research a step further. This effort will help addresses the important aspect of ways to sustain firms IT-related capabilities. However, this instrument cannot meet all needs. Other resources may also reflect the existence of the IT-Usage Platform. Firms may also have other resources in their 'bundle of resources' whose synergy can create other higher-level dynamic capabilities. The theoretical frameworks suggested in this study can help in suggesting these capabilities, and discussed approach can help in developing and validating the instrument. Our approach uses perceptions and beliefs, and while these help to understand actual behaviors (Silver, 1988), it presents some concerns. However, we believe our effort contributes to moving the IT business value research forward. We hope fellow researchers find this effort useful in their endeavor to obtain a deeper level of understanding of how IT contributes to business value.

Lateral IT Governance Structure (IT Steering Committee)	
IG1	In our organization, the IT steering committee makes IT-related resource allocation decisions relating to system development and recruitment, and training.
IG2	In our organization, the IT steering committee improves visibility of IT and revamps the IT practices.
IG3	In our organization, the IT steering committee considers keeping and sustaining necessary reserved servers centrally.
IG4	In our organization, the IT steering committee helps to facilitate the IT coordinating requirements and practices.
IG5	In our organization, the IT steering committee solicits the support of top management for IT activities.
IG6	In our organization, the IT steering committee recognizes the contribution of operational-level managers.
IG7	In our organization, the IT steering committee, the IT steering committee relates well to other IT governance structures.
Organization Design - Task	
OT1	In our organization, the operational level management sets the pace of work of their subordinates.
OT2	In our organization, the operational level management schedules work.
OT3	In our organization, the operational level management distributes work among the subordinates.
OT4	In our organization, the operational level management decides how to accomplish the tasks.
OT5	In our organization, the operational level management deals with difficult situations in production.
Organisation Design – Environment	
OE1	In our organization, the business units use self-managing teams effectively.
OE2	In our organization, the business units use employee involvement groups effectively.
OE4	In our organization, the business units use team-building or group cohesion techniques effectively.
Incentive Systems	
IC1	Our organization has an equitable incentive based reward system.
IC2	Our organization provides group incentives.
IC3	Our organization has performance-based promotion.
IC4	Our organization performs regular performance reviews.
IC5	Our organization weights performance aspects effectively.

Appendix 1. Final IT-Usage Platform Instrument

REFERENCES

1. Baily, T. (1993) Discretionary Effort and the Organization of Work: Employee Participation and Work Reform since Hawthorne, New York: Institute on Education and the Economy, Teachers College, Columbia University.
2. Baker, G., Gibbons, R. and Murphy, K.J. (2002) Relational contracts and the theory of the firm, *Quarterly Journal of Economics,* 117, 39-85.
3. Barney, J.B. (1991) Firm Resources and Sustained Competitive Advantage, *Journal of Management,* 17, 1, 99-120.
4. Becker, B.W. and Gerhart, B. (1996) The Impact of Human Resource Management of Organisational Performance: Progress and Prospects, *Academy of Management Journal,* 39, 4, 779-801.
5. Bowen, P.L., Chung, M.D. and Rohde, F.H. (2007) Enhancing IT Governance Practices: A model and Case Study of an Organisation's Efforts, *International Journal of Accounting Information Systems,* 8, 191-221.
6. Brickly, J.A., Smith, C.W. and Zimmerman, J.L. (1996) Organisational Architecture: A Managerial Economics Approach, Irvin, New York.

7. Brynjolfsson, E. and Hitt, L. (1997) MIT analysis: Breaking boundaries, *Informationweek,* 649, 54-61.
8. Clemons, E.K. and Row, M.C. (1991) Sustaining IT advantage: The role of structural differences, *MIS Quarterly,* 15, 275-292.
9. Coase, R. (1937) The nature of the firm, *Economica,* 4, 386-405.
10. Cohen, J. (1960) A coefficient of agreement for nominal scales.37-46.
11. Davis, F.D. (1989) Perceived Usefulness, Perceved Ease of Use, and User Acceptance of Information Technology, *MIS Quarterly,* September, 319-340.
12. Earl, M.J. (1993) Experiences in strategic information systems planning, *MIS Quarterly,* 17, 1, 1-24.
13. Grant, R.M. (2008) Contemporary Strategy Analysis, Blackwell Publishing, Oxford.
14. Hayek, F.A.v. (1945) The use of knowledge in society, *American Economic Review,* 35, 519-530.
15. Hitt, L.M. and Brynjolfsson, E. (1997) Information Technology and Internal Firm Organization: An Exploratory Analysis, *Journal of Management Information Systems,* 14, 81-101.
16. Holmstrom, B. (1999) Managerial incentive problems: A dynamic perspective.169-182.
17. Huselid, M.A. (1995) The Impact of Human Resource Management Practices on Turnover, Productivity, and Corporate Financial Performance *Academy of Management Journal,* 38, 3, 635-672.
18. Ichniowski, C., Shaw, K. and Prennushi, G. (1997) The Effects of Human Resource Management Practices on Productivity: A Study of Steel Finishing Lines.291-315.
19. IT Governance Institute (2007) IT Governance Status Report, www.itgi.org.
20. Jensen, M. and Meckling, W. (1992) Knowledge, Control and Organisational Structure, in L. Werin and H. Wijkander (Eds.) *Contract Economics*, Blackwell, Cambridge, 1992.
21. Johnson, A.M. and Lederer, A.L. (2005) The Effect of Communication Frequency and Channel Richness on the Convergence Between Chief Executive and Chief Information Officers, *Journal of Management Information Systems,* 22, 2, 227-252.
22. Kandel, E. and Lazear, E. (1992) Peer Pressure and Partnership, *Journal of Political Economy,* 100, 4, 801-817.
23. Karimi, J., Bhattacherjee, A., Gupta, Y.P. and Somers, T.M. (2000) The effects of MIS steering committees on information technology management sophistication, *Journal of Management Information Systems,* 17, 2, 207-234.
24. Malhotra, N.K., Kim, S.S. and Patil, A. (2006) Common Method Variance in IS Research: A Comparison of Alternative Approaches and a Reanalysis of Past Research, *Management Science,* 52, 12, 1865-1883.
25. Mata, F.J., Fuerst, W.L. and Barney, J.B. (1995) Information technology and sustained competitive advantage: A resource-based analysis, *MIS Quarterly,* 19, 4, 487-505.
26. Milgrom, P. and Roberts, J. (1990) The economics of modern manufacturing: Technology, strategy, and organization, *American Economic Review,* 80, 511-528.
27. Milgrom, P., Roberts, J. and March, M. (1995) Complementarities and Fit: Strategy, Structure, and Organizational Change in Manufacturing, *Journal of Accounting and Economics,* 19, 179-208.
28. Moore, G.C. and Benbasat, I. (1991) Development of an Instrument to Measure the Perceptions of Adopting an Information Technology Innovation, *Information Systems Research,* 2, 192-222.
29. Nolan, R. and Croson, D.C. (1995) Creative Destruction
30. Havard Business School Press, Boston, MA.
31. Nunnally, J.C. (1978) Psychometric Theory, McGraw-Hill, New York, NY.
32. Polanyi, M. (1966) The Tacit Dimension, Doubleday, New York.
33. Powell, T.C., Lovallo, D. and Caringal, C. (2006) Causal Ambiguity, Management Perception, and Firm Performance, *Academy of Management Review,* 31, 1, 175-196.
34. Rockart, J.F. and Short, J.E. (1989) IT in the 1990s: Managing Organizational Interdependence, *Sloan Management Review,* 30, 2, 7-17.
35. Silver, M.S. (1988) User Perceptions of Decision Support System Restrictiveness: An Experiment, *Journal of Management Information Systems,* 5, 1, 51-65.

36. Straub, D.W., Rai, A. and Klein, R. (2004) Measuring Firm Performance at the Network Level: A Nomology of the Business Impact of Digital Supply Networks, *Journal of Management Information Systems,* 21, 1, 83-114.
37. Teece, D. (2007) Explicating Dynamic Capabilities: The Nature and Microfoundations of (Sustainable) Enterprise Performance, *Strategic Management Journal,* 28, 1319-1350.
38. Teece, D.J., Pisano, G. and Shuen, A. (1997) Dynamic capabilities and strategic management, *Strategic Management Journal,* 18, 509-533.
39. Weill, P. and Ross, J.W. (2004) IT Governance: How Top Performers Manage IT Decision Rights for Superior Results, Harvard Business School Press, Boston, MA.