

## Association for Information Systems AIS Electronic Library (AISeL)

---

ECIS 2005 Proceedings

European Conference on Information Systems  
(ECIS)

---

2005

# Integrating Dynamic Capability and Commitment Theory for Research on IT Capabilities and Resources

Tom Butler

University College Cork, [tbutler@afis.ucc.ie](mailto:tbutler@afis.ucc.ie)

Ciaran Murphy

University College Cork, [cmurphy@afis.ucc.ie](mailto:cmurphy@afis.ucc.ie)

Follow this and additional works at: <http://aisel.aisnet.org/ecis2005>

---

### Recommended Citation

Butler, Tom and Murphy, Ciaran, "Integrating Dynamic Capability and Commitment Theory for Research on IT Capabilities and Resources" (2005). *ECIS 2005 Proceedings*. 90.

<http://aisel.aisnet.org/ecis2005/90>

This material is brought to you by the European Conference on Information Systems (ECIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in ECIS 2005 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact [elibrary@aisnet.org](mailto:elibrary@aisnet.org).

# INTEGRATING DYNAMIC CAPABILITY AND COMMITMENT THEORY FOR RESEARCH ON IT CAPABILITIES AND RESOURCES

Butler, Tom, University College Cork, Cork City, Ireland, [tbutler@afis.ucc.ie](mailto:tbutler@afis.ucc.ie)

Murphy, Ciaran, University College Cork, Cork City, Ireland, [CMurphy@afis.ucc.ie](mailto:CMurphy@afis.ucc.ie)

## Abstract

*Recent studies have highlighted the utility of the resource-based view (RBV) in understanding the development and application of IT capabilities and resources in organisations. Nevertheless, IS research has inadvertently carried over several fundamental problems and weaknesses with the RBV from reference disciplines. This paper proposes an integrative theory, model and research framework that draws on dynamic capabilities theory from the resource-based view of the firm in institutional economics, and commitment theory in institutional sociology, to explain and understand the process by which IT capabilities and resources are developed and applied in organizations. In so doing, this study addresses the paucity of theory on the role of IT capabilities in building and leveraging firm-specific IT resources. The study also addresses the aforementioned problems and weaknesses to build a logically consistent and falsifiable theory, with relatively superior explanatory power, for application in both variance and process-based research, whether positivist or interpretivist in orientation.*

*Keywords: Resource-based View, Dynamic Capabilities, IT Capability, Commitment.*

# 1 INTRODUCTION

Researchers in the IS field have noted that the process by which IT capabilities are created, developed and applied is not well understood. Take, for example, this comment by Bharadwaj (2000, p. 188): “The underlying mechanisms through which...superior IT-capability leads to improved firm performance...is by no means clear. Additional research is needed to identify the full chain of variables connecting IT-capability to firm performance.” While a recent review paper by Wade and Hulland (2004) made progress in this direction, Bharadwaj’s call for a refined theoretical model remains unanswered. This paper proposes a theoretical model and associated research framework to examine the development and application of IT capabilities and resources as key components of core or distinctive competence in knowledge-intensive firms. Following calls made by Williamson (1998) and Knudsen (1994), the integrative theoretical model incorporates a set of descriptive microanalytic attributes that describe a firm’s capabilities and resources—core, enabling and supplemental—while also including an intentionality view or behavioural theory that helps explain how organisational knowledge translates into capabilities. The recent work of Teece and Pisano (1998) on the dynamic capabilities of firms, and Philip Selznick’s (1949, 1957) concept of commitment, provide the model with its principal theoretical and analytic components. The inclusion of Selznick’s theoretical perspective provides this study with normative and cognitive foci to augment the predominantly regulative focus of theory in institutional economics. The rationale behind this integrative approach to theory building originates in Scott’s (1995) contention that the various schools of institutional thought do not give equal weight to regulative (rules and laws institutionalised as protocols and routines in support of governance and power systems), normative (values and expectations that govern conformity and performance of duty within institutional regimes and authority systems), and cognitive (symbols, categories and typifications which shape performance programs, scripts and institutional identity) forces that shape institutions and organizations. Rather, researchers have generally stressed one or other as central, while implicitly incorporating others (DiMaggio and Powell 1983). This study therefore adopts a holistic perspective and adopts a view of organizations and institutions that operates at several levels of analysis and which incorporates a theory of human behaviour that recognizes the primacy of social rationality.

## 2 INSTITUTIONAL THEORY AND THE RBV: PROMISE AND PROBLEMS

Institutional theory has been employed fruitfully by a number of IS researchers to help explain and understand the development, application and use of IT in organizations. The resourced-based view (RBV) is one strand of institutional theory that IS researchers find attractive because of its theoretical utility in explicating the link between IT-related resources, the capabilities required to develop and apply them, and the performance outcomes for and/or competitive success of enterprises (Mata & Fuerst & Barney 1995, Bharadwaj 2000, Wheeler 2002, Wade & Hulland 2004).

Resource-based theory is chiefly regulative in orientation and views the firm as a bundle of idiosyncratic resources and related capabilities the interplay of which deliver competitive advantage (Rumelt 1984). The origins of this theory of the firm are in institutional economics and institutional sociology. In economics, for example, Penrose (1959) conceives the firm as a collection of competencies that embody its knowledge. Following Hayek (1945), Penrose argues that a firm’s competitive position is dependent on the manner in which the experiential knowledge of its personnel is developed and leveraged. Penrose (1959) notes that the services (and products) provided by a firm’s resources are of strategic import—not resources *per se*. However, the delivery of firm-specific services is dependent on how resources are employed, which is in turn dependent on the capabilities of organizational actors. Capabilities are thus conceptualized as the efficient and effective application of the experiential knowledge of the firm’s personnel. The view of organisations as “*repositories of*

*productive knowledge*” is expanded upon by Nelson and Winter (1982, p. 175), who maintain that an organization’s productive knowledge is to be found in its operational routines. Nelson and Winter argue that routines allow organisations to cope with complexity and uncertainty under the conditions of bounded rationality; in addition, they provide an efficient way of storing an organisation’s accumulated experiential knowledge. Nelson and Winter also posit that organizational routines are the basis of a firm’s distinctiveness and are, therefore, the source of its competitiveness. Thus, the resource-based view considers the firm as a repository of knowledge, rather than a response to information-related problems, which is the focus of theories such as transaction cost economics, agency theory, and so on (Fransman 1998).

The resourced-based view is attractive to IS researchers because of its theoretical utility in explicating the link between IT resources, the capabilities required to develop and apply them, and the competitive success of enterprises (see, for examples, Mata et al.1995, Wade & Hulland 2004, and Wheeler 2003). The primary argument of this strand of research is articulated by Henderson and Venkatraman (1993), who point out that sophisticated technological functionality does not secure competitive advantage for firms. Rather, sustainable competitive advantage emanates from the application of business and IT capabilities to develop and leverage a firm’s IT resource for the purpose of organizational reconfiguration, transformation, integration and learning, all of which underpin the delivery of products and services. However, echoing arguments made by Penrose (1959) and Nelson and Winter (1984), Henderson and Venkatraman argue that business and IT capabilities are embodied in the firm-specific knowledge of organizational actors—which is itself an intangible asset or resource. Thus, the notion that knowledge is the only firm-specific (valuable, unique, and imperfectly mobile) asset or resource was readily accepted in the IS field (see, for example, Andreu & Ciborra 1996).

Several issues require attention, however, in regard to the RBV and its use for research in the IS field. The first of these concerns the inability of IS researchers to fully integrate regulative, normative and cognitive strands of institutional theory in their research so as to understand comprehensively how IT capabilities and resources are created, developed, and applied in organisations. The second issue is articulated by Nanda (1996, p. 93), who argues that the resource-based view “is in a state of considerable flux and confusion...and that [m]utually contradictory definitions abound”. Nanda (ibid.) argues that in formulating theory “researchers draw widely different normative prescriptions, and there is a paucity of work linking the resource paradigm with intraorganizational processes.” For example, Nanda illustrates that researchers employ terms like resources, assets, competencies and capabilities interchangeably in presenting their theoretical arguments or when describing their empirical findings<sup>1</sup>. In addition, several researchers have presented their own idiosyncratic conceptual definitions, while ignoring those articulated in established literature. All of this has occurred at the expense of building an accepted conceptual lexicon. A later critique of the RBV by Priem and Butler (2001) echoed these arguments. Unfortunately, this definitional ‘confusion’ has also been evident in several IS-based studies cited above. For example, a much-cited conceptual overview of the RBV by Mata et al. (1995), and, more recently, research by Wheeler (2002) and Wade and Hulland (2004), treat the concepts of capabilities and resources as conceptual synonyms, when clearly they are not. Such incidences of definitional confusion tend to support arguments made by critics of the RBV and those within the IS field who question IS researchers’ understanding and use of theory from reference disciplines (see Checkland & Holwell 1998).

---

<sup>1</sup> It is important to make a distinction between a competence or capability and the assets or resources which they relate to and operate on. For example, a competence or capability in hammering nails refers to three physical objects or resources/ assets—a hammer, nails, and the object(s) to be nailed. In describing a competence or capability, therefore, it is customary to refer to the object or asset/resource that one has a competence in using, but not to include it as a competence or capability.

The third problem is articulated by Knudsen (1994) who, echoing Nanda (1996), argues that institutional economists, particularly those responsible for articulating the resource-based view of the firm, fail to adopt a process-based perspective when conducting their research and, instead, focus on outcomes variables, which do little to explain the dynamic nature of capabilities, their creation, and application. In order to address these problems, an integrative theoretical model is proposed, the conceptual components of which have been the subject of debate in economics, sociology, organization theory and strategic management for some time. This task is now undertaken.

### 3 UNDERSTANDING IT CAPABILITIES AND RESOURCES: THE DYNAMIC CAPABILITIES FRAMEWORK

In assessing the contribution of the RBV, Williamson (1998, p. 28) poses the following question:

[W]hat—in addition to an inventory of its physical assets, an accounting for its financial assets, and a census of its workforce—is needed to describe the capabilities of a firm[?]

He (ibid., p. 28) argues that this will require the articulation of an “intentionality view...that [incorporates] microanalytic attributes that define culture, communication codes, and routines,” he also emphasizes that this “is an ambitious exercise.” This section begins the task of describing just such a set of ‘microanalytic attributes,’ thereby answering to Williamson’s call. It is clear from comments made by Richard Nelson (1994) that the dynamic capabilities framework of Teece and Pisano (1998), which builds on that proposed by Teece, Pisano and Shuen (1990), is the most appropriate candidate, as it incorporates extant theory and correctly focuses on the dynamic capabilities of firms (see Wheeler 2002).

While the dynamic capabilities perspective has been widely accepted in the literature, recent research by Teece and Pisano (1998) develop it into a conceptual framework that helps capture and describe the nature of a firm’s distinctive or core competence. In presenting their framework, Teece and Pisano focus on the development and renewal of internal and external firm-specific capabilities as being of strategic importance to business enterprises. The concept of dynamic capabilities incorporates two valuable observations: first, the shifting character of the economic environment renders it dynamic—for example, decreasing time to market for products, shifting barriers to entry through technological change, globalization of national economies, and environmental uncertainty caused by political strife; second, organizational capabilities lie at the source of competitive success. In elaborating their perspective, Teece and Pisano (1998, p. 195) state that core capabilities must be “*honed to a user need*”, must be “*unique*”, and “*difficult to replicate*”. Enabling capabilities, on the other hand are those deemed necessary for firms to enter the game, while supplemental capabilities are non-proprietary and imitable (Leonard-Barton 1995). In order to understand firm-specific dynamic capabilities, Teece and Pisano present an analytic framework that incorporates a set of descriptive dimensions or attributes that help researchers and practitioners evaluate and understand the source of such capabilities—these are now delineated.

**Organizational and Managerial Processes:** These describe the patterns of current practice and learning in a firm, tangible evidence of which is to be found in its routines. For Example, *Integration* processes are concerned with the efficient and effective internal coordination of organizational activities and production. In knowledge intensive firms, integration is also concerned with routines and mechanisms for knowledge sharing. *Learning* processes involve repetition and experimentation to enable tasks to be performed better and more rapidly—this occurs at the level of the individual, group, organizational and interorganisational levels. *Reconfiguration and Transformation* processes relate the capabilities required to evolve a firm’s asset structure.

**Asset Positions:** These include a firm’s endowment of technology and intellectual property (as indicated by its difficult-to-trade knowledge assets) as well as its relational assets with partners, customers and supplier. *Technological Assets*, such as IT, may generally be considered commodities,

and confer no strategic advantage; however, if they are highly firm- and task-specific, or if generic technologies can be configured in such a way as to make them unique, then they are of strategic value. Also, if the knowledge which created such assets is also proprietary and firm-specific then this adds a further ring of protection. *Complementary Assets* involve the use of related assets to develop new products and services or the mechanisms by which they are to be delivered. Such assets are considered complementary and typically have uses beyond their immediate function. *Financial Assets* include the state of the balance sheet, a firm's cash position, and degree of financial leverage. Experiential knowledge and skills in financial management may be of strategic value here. Finally, a firm's *Locational Assets* may influence its ability to produce and distribute products and services at low cost. Some locational assets are non-tradable and therefore the source of difficult-to-replicate advantages.

**Paths:** The strategic alternatives available to a firm are a function of its past activities and positions. A consideration of *Path Dependencies* help us understand exactly how the firm's present market position is a function of its past performance and future possibilities. However, a firm's past investments and present repertoire of productive routines may act to constrain its future behaviour and choice of action. The *Technological Opportunities* presented to a firm are often down to internal and external organizational and institutional structures, collaborations and knowledge links. Quite often it is the idiosyncratic experiential knowledge of firms that guides them in choosing the most appropriate and feasible of opportunities, and leads them to develop the business and IT capabilities that enable them to realize such opportunities.

Teece and Pisano's (1998) framework helps answer Williamson's call for an 'intentionality view' of the firm, while considering an organization's culture, communication codes, and routines, in addition to accounting for its assets. However, the framework does not provide a behavioural dimension that would help explain how (and why) organizational actors develop capabilities and apply them in organizational contexts. Although implicit in many theories in institutional economics, Fransman (1998) maintains that the concept of bounded rationality is inappropriate as a behavioural theory to help explain how (and why) capabilities are developed. Likewise, Perrow (1984) comments on the limitations of bounded rationality, and argues that social rationality better explains the behaviour of organizational actors—hence, the relevance and inclusion of theory from institutional sociology, as outlined in the following section.

## 4      **DISTINCTIVE COMPETENCE AND INSTITUTIONAL THEORY IN SOCIOLOGY**

The concept of distinctive competence was developed by Phillip Selznick's in his seminal work *Leadership in Administration*—Selznick's theory subsequently informed Hamel and Prahalad's (1994) work on core competence and Leonard-Barton's (1995) treatise on core capabilities. Selznick (1957) argued that it is the various commitments entered into by organisational stakeholders that defines an organisation's character and bestows upon it a *distinctive competence* in the conduct of its affairs. For Selznick, commitment is an enforced component of social action—as such it refers to the binding of an individual to particular behavioural acts in the pursuit of organisational objectives. One of the chief strengths of Selznick's perspective is its emphasis on group and organizational levels of analysis.

The process of institutionalisation gives rise to, and shapes, the commitments of organizational actors and groupings (Selznick 1949, 1957). Such commitments in turn define an organization's character for good or ill, thereby bestowing upon it a *distinctive competence*—when commitments are aligned with organizational imperatives—or a *distinctive incompetence*—when commitments are misaligned with organizational imperatives or are dysfunctional in nature. Following Selznick, Leonard-Barton (1992) argues that this gives rise to 'core rigidities' in organizations, which, she argues, are the flip-side of 'core capabilities'. Thus, the process of institutionalization is a double-edged sword, depending on the manner in which commitments are formed. This is an important point, organizational, group, and

individual commitments determine whether organizational resources are employed with maximum efficiency and whether organizational capabilities are developed to leverage such resources to attain a competitive advantage (Selznick 1957).

<i>Type of Commitment</i>	<i>Description</i>
Commitments enforced by uniquely organisational imperatives.	Organisational imperatives, which reflect business objectives, are concerned with 'reality' maintenance. They are usually implemented by policy decisions associated with system maintenance; consequently, they ensure that the organisational requirements of order, discipline, unity, defence, and consent are fulfilled.
Commitments enforced by the social character of the personnel.	The personnel, or so-called human capital, in an organisation come to the firm with particular needs, levels of aspiration, training and education, social ideals and class interest; thus, influences from the external environment are directly imported into an organisation by its personnel.
Commitments enforced by institutionalization.	Because organisations are social systems, goals, policies or procedures tend to achieve an established, value impregnated status. Commitment to established or institutionalized patterns is thereby accomplished, restricting choice and enforcing specific behavioural standards.
Commitments enforced by the social and cultural environment.	Organisational policies and outcomes are often influenced and shaped by actors in the external social and cultural environment.
Commitments enforced by the centres of interest generated in the course of action.	Decentralization and delegation of decision making to particular individuals and groups within an organisation runs the risk that policies and programs are influenced by the tangential informal goals of these individuals and sectional interests; as such they may be unanticipated and incongruent with those of the organisation.

*Table 1 A Framework and Taxonomy for Understanding Organisational Commitments*

Several forms of commitment are described by Selznick (1949): their locus of origin range from the social character of individual actors to groups operating on the basis of sectional interests, to those enforced by institutional norms and organisational imperatives, and, finally, to commitments enforced by the external social and cultural environment (see Table 1 for a more detailed account of Selznick's theoretical concepts). Thus, as Selznick (1957) argues, it is through commitment, enforced as it is by a complex web of factors and circumstances, and operating at all levels within an organisation, that social actors influence organisational strategies and outcomes. However, these commitments do not evolve spontaneously, they are shaped by 'critical decisions' that reflect or constitute management policy: as Selznick illustrates, the visible hand of leadership influences the social and technological character of organisations and helps shape *distinctive competence* in them.

Support for Selznick's position comes from several quarters. Knudsen (1994) offers direct support and recommends Selznick's (1957) institutional theory as a suitable process-based perspective to augment the outcome-centric view of organizational competence prevalent in the literature on the RBV. Of import here is Knudsen's contention that the deficiencies in resource-based perspectives (in adaptationist sociological theory and in equilibrium-based economic theory) are countered by the fact that Selznick's institutional theory captures the dynamics of the continuous exchange and interrelationships between an organization's latent competencies and its structure and processes. Knudsen argues that these are an expression of a firm's accumulated knowledge and are a consequence of human design and 'intentionality' as expressed by the commitments entered into by the organization's stakeholders. Selznick's work therefore provides appropriate behavioural foundations for the resource-based view of the firm, which has hitherto operated from the perspective of bounded rationality. In terms of the design and development of computer-based information systems, Winograd and Flores (1986) highlight the role of commitment in shaping the design of such

systems. However, in the field of management, Ulrich (1998) calls for researchers to focus on the relationship between commitment and competence or capability building in organisations.

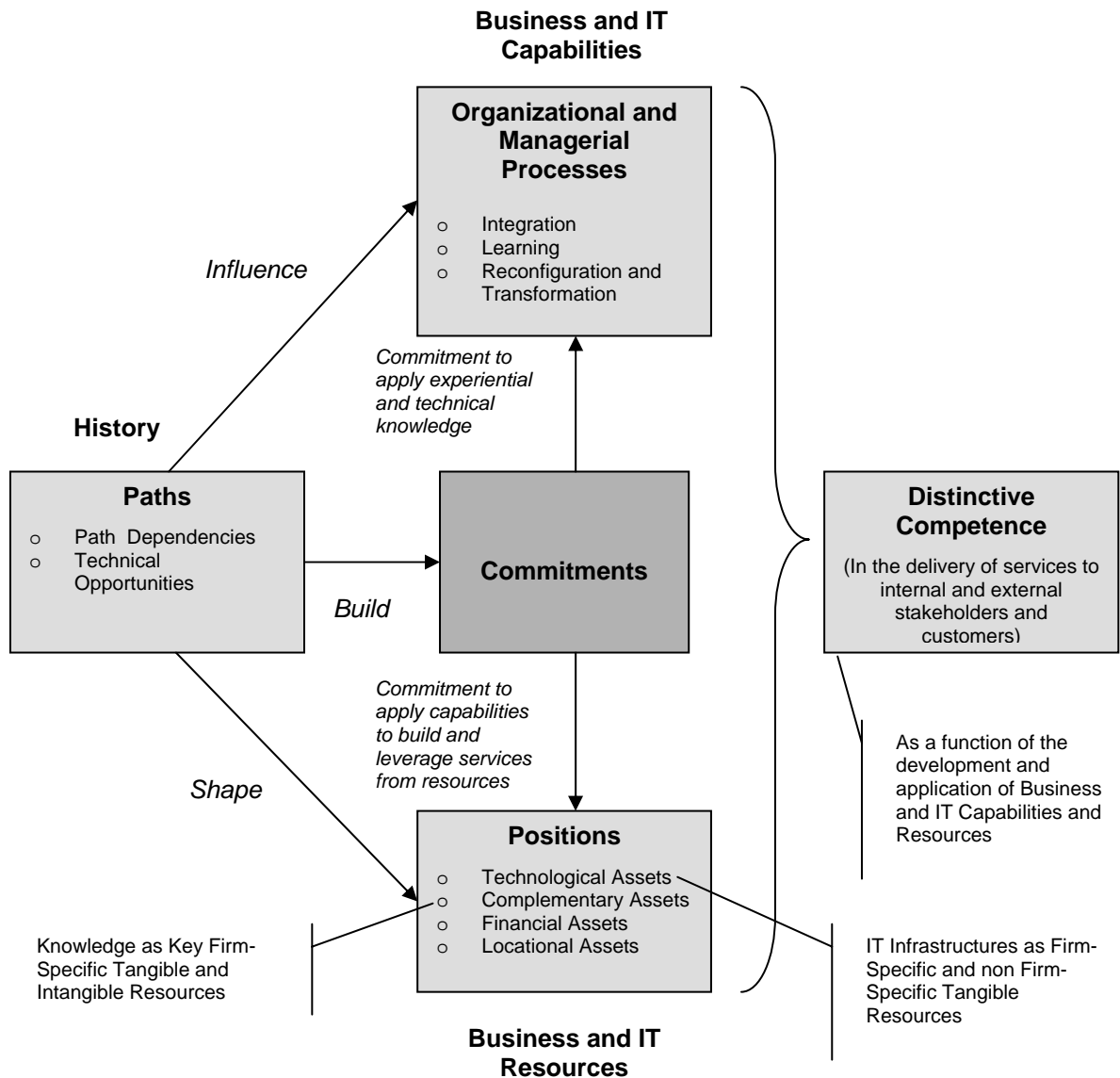


Figure 1 An Integrative Theoretical Model for Understanding the Development and Application of IT Capabilities and Resources

## 5 TOWARDS AN INTEGRATIVE THEORETICAL MODEL OF IT CAPABILITIES, RESOURCES AND COMMITMENT

Following Wheeler (2003, p.129), this paper argues for the importance of theory in the research process because it acts “to impose order on unordered experiences to increase human understanding and prediction in the real world.” In the positivist scheme of things, theory posits relationships between independent and dependent variables or antecedents and outcomes, while also determining what data is to be collected (Wheeler, 2003). From an interpretivist perspective, theory acts to help formulate a pre-understanding or to enrich extant understandings of IS phenomena (Butler, 1998)—the



integrative dynamic capability theory presented in this paper accords well with both positivist and interpretive perspectives.

Having introduced the conceptual components of this study's integrative model of business and IT capabilities and resources in some detail, this paper's theoretical model is now presented in Figure 1. Unlike previous conceptualizations, this model is process-based, in that the 'microanalytic attributes' of organizational and managerial processes are further elaborated by the application of Selznick's (1949, 1957) theory of commitment, thereby capturing the multi-faceted nature of the phenomenon. The role of the explicit and tacit knowledge as the tangible and intangible resources which underpins capability development is also recognised (Nonaka & Takeuchi 1995, Andreu & Ciborra 1996, Fransman, 1998). Furthermore, the model's scope and constituent concepts map well onto Benbasat and Zmud's (2003, p. 186) "view...of the phenomena studied by IS scholars" and its articulation in their conceptualization of the "IT artifact and its immediate nomological net."

The kernel of the extended dynamic capabilities theory as articulated in the integrative theoretical model is as follows:

A firm's business and IT capabilities and resources are the product of its past activities and are observable in its organisational and managerial processes (capabilities) and asset positions (resources). The various commitments entered into by organisational stakeholders, in the pursuit of business, social, cultural, sectional and personal objectives, determine how efficiently and effectively valuable services are leveraged from resources through the application of business and IT capabilities. This, in turn, determines whether a firm develops a core capability or distinctive competence in conducting its activities and which help it meet its business objectives. Building core capabilities and firm-specific resources is a product of the application of business and IT firm-specific tangible (explicit) and intangible (tacit) knowledge.

Elaborating on this kernel definition, IT capabilities are conceptualised as knowledge in action—that is, the application of experiential and technical knowledge of committed IT professionals to acquire, build and deploy the hardware and software components of a firm's IT architecture. At a fundamental level, core, enabling and supplemental capabilities are applied in IS-related activities such as project management, IS analysis and design, programming, the use of IT-based Integrated Development Environments (IDE), systems administration (Windows 2003, Linux and related workstation/server/networking platforms etc.), telecommunications infrastructure management, and technical support, to name but a few. From an IT capabilities perspective, IT capabilities operate on IT-based resources such as project management tools, IT-based analysis and design technologies, programming paradigms (.NET, J2EE etc.) and development technologies and platforms (Visual Studio, IntelliJ etc.), management of information and communication technology (ICT) infrastructures etc. to produce IT infrastructure resources for business. Of course, IT capabilities arise from and operate on explicit and tacit business and IT meta-, standard technical, industry, technical trade, intraorganisational, and unique knowledge (Nordhaug 1994: cf. Wade and Hulland (2004) on the role of knowledge of the business and IS technical knowledge and skills).

As IT hardware and software infrastructures (e.g. eCommerce/eBusiness technologies) are increasingly being leveraged to deliver superior value propositions and services to internal stakeholders, customers, and business partners, they have acquired the status of firm-specific (i.e., valuable, rare, appropriate, imperfectly imitable, non-substitutable, and imperfectly mobile) resources: accordingly, the IT capabilities that are used to acquire, build, deploy and manage these resources in pursuit of business objectives have become core capabilities for business enterprises. It is important to note therefore that important synergies and relationships exist between business and IT capabilities and resources.

Theoretical Observations and Empirical Examples
<p><b>Observation 1:</b> A firm's IT capabilities and resources are the product of its history. This observation indicates the need to study the historical activities and performance of firms. Butler (2002) illustrates, for example, the way in which News International Newspapers Ltd. developed its IT capabilities and resources to meet specific business objectives.</p>
<p><b>Observation 2:</b> IT capabilities and resources (tangible and intangible) may be core (that is firm-specific, valuable, rare, and inimitable), enabling (industry specific), or supplemental (commodities). Many component IT software and hardware resources at News International and EPL were commodities, while others were industry specific. Unique combinations and innovative customisation of supplemental and enabling IT resources through the application of firm-specific IT capabilities made them core or strategic (Butler, 2002).</p>
<p><b>Observation 3:</b> The development and application of IT capabilities and resources are influenced and shaped by the commitments entered into by an organization, its members, and wider institutions. In all four organisations studied by Butler (2002) the existence of core business and IT capabilities and resources were observed to be a function of the optimal alignment of individual, group/sectional, social and cultural commitments with business objectives, as expressed by commitments to organisational imperatives. In two of the organisations, News International and EPL, core rigidities—that is attachment to outmoded capabilities and resources—were only overcome when the various commitments identified by Selznick (1949) were properly aligned in the pursuance of business objectives.</p>
<p><b>Observation 4:</b> IT capabilities operate on resources to produce services that are of value to internal and external stakeholders and customers. Butler (2002) reports that the software development company IMS possessed a range of software capabilities, based on idiosyncratic knowledge of particular technologies (e.g. multimedia and Case-based Reasoning (CBR)), that enabled it to produce software-based services in the area of learning and knowledge management to customers in the financial services, electronic and real estate sectors.</p>
<p><b>Observation 5:</b> IT capabilities are, at base, knowledge in action: they are often embedded in the processes, routines and operational procedures of an organisation. Butler (2002) illustrates that the Sales and Marketing Divisions at microelectronics manufacturer Analog Devices Inc. possessed a unique blend of business and IT experiential and technical knowledge that saw user-led development of IT-based strategic sales and marketing solutions.</p>
<p><b>Observation 6:</b> Valuable IT capabilities are dynamic in nature and are evidenced by a firm's and/or IS function's integrative capacities, ability to learn, and abilities to transform and reconfigure their operations in response to environmental conditions. Butler (2002) illustrates that News International and EPL were leaders in the innovative application of IT to stay ahead of competitors in the newspaper industry. They achieved this through a mixture of experimentation, collaborative partnerships, that saw transfers of knowledge within and between suppliers and partners, IT professionals and business staff. Butler also reports that IMS' success in developing and applying innovative CBR technologies grew in a similar fashion through pan-European collaborations.</p>
<p><b>Observation 7:</b> Integration, Learning and Reconfiguration and Transformation IT capabilities are the product of systematic, patterned, responsive interaction of committed individuals and groups shape an organization's business and IT capabilities. Butler (2002) reveals that high-levels of positive commitments characterised business and IT communities of practice in all four organisations in his study—as such, individuals and sectional groupings of knowledge workers developed learning routines and habits that predisposed them to transfer and integrate their knowledge while being open to the need for change.</p>
<p><b>Observation 8:</b> Capabilities are 'sticky' and difficult to imitate or replicate, even across 'communities-of-practice' in and across organisations. While this is generally true of inter-organisational knowledge and capability transfers (e.g. in the newspaper industry, where organisation-specific commitments militate against learning), Butler (2002) illustrates the institutional and cultural conditions that are conducive to capability transfers within and between organisations.</p>
<p><b>Observation 9:</b> IT Resources in and of themselves contribute nothing to a firm's competitive position in the marketplace. Butler's (2002) case study of ADI illustrates how IT-literate business managers made all the difference in applying supplemental and enabling IT resources through their in-depth knowledge of their business practices and products. Without such firm-specific capabilities and knowledge, commodity-like IT resources would, in and of themselves, not have delivered valuable services to internal or external stakeholders and customers.</p>
<p><b>Observation 10:</b> Tangible IT resources are usually commodities, while intangible IT-related resources are not. The point being made here is that intangible experiential knowledge of the use and deployment of IT artefacts is the differentiating factor across firms. Both the News International and IMS cases provide vivid</p>

empirical examples of this (Butler, 2002).
<b>Observation 11:</b> Tangible and Intangible knowledge resources (experiential and technical) underpin all business and IT capabilities. Nordhaug (1994) and Nonaka and Takeuchi (1995) delineate the relationship between explicit and tacit knowledge and capabilities. The News International and IMS cases provide good IT-related examples (Butler, 2002), while Leonard Barton (1995) presents general instances of this relationship in her study of Chaparral Steel.
<b>Observation 13:</b> It is the services, both tangible and intangible, produced by firm-specific IT capabilities and resources and in pursuit of sound business objectives, which are of strategic and competitive value, not resources or capabilities per se. The EPL, News International and IMS cases provide evidence of this. For example, while EPL had state of the art IT systems and capabilities to match, during the 1980s and 1990s, another newspaper company, Irish Times Ltd., did not (Butler, 2002)—the latter, however, had greater market share in terms of circulation and readership. Likewise, Eddie Shah’s UK-based Today newspaper went out of business, despite having leading-edge technologies. In both examples, sound strategies and related objectives were absent from their business models. Likewise, IMS possessed superior IT capabilities and resources, yet their ability to capture market share in knowledge management tools sector was limited, despite initial success. Finally, Butler illustrates that IT-literate business communities of practice at Analog Devices Inc. were, more often than not, more effective in meeting their information systems needs and delivering services to internal and external clients than the company’s IS function.

*Table 2 An Analytic Framework Drawn from the Extended Theory of Dynamic Capabilities*

## 5.1 Theoretical Observations and Analysis

Based on insights from the literature cited previously, Table 2 presents several observations drawn from this study’s theoretical model. These describe at a high level of analysis the central tenets of this paper’s elaboration of the RBV and the role of commitment in shaping the development and application of capabilities. The observations are the product of logical deductions informed by critical analysis of the different strands of institutional thought that surround the RBV. As such they address many of the theoretical limitations of the RBV (Nanda 1996, Priem & Butler, 2002), while also extending and elaborating the theory of dynamic capabilities, and simultaneously building in a behavioural dimension by applying a theory of commitment that operates on several levels of analysis. In addition, each observation is elaborated by empirical examples drawn from extensive research by Butler (2002)<sup>2</sup>, which assesses the business and IT competence profiles of four organizations: two newspaper company’s—News International Newspapers Ltd. And Examiner Publications Ltd. (EPL); microelectronics manufacturer, Analog Devices Inc. (ADI); and Interactive Multimedia Systems Ltd. (IMS), a software company. The framework of theoretical observations and associated model therefore prepare the way for future process-based research of an interpretive nature on IT capabilities and resources, while also helping to inform the conduct of variance-based research strategies.

## 6 CONCLUSIONS

This paper has drawn on old and new institutional thought in economics and sociology in order to posit a theory of business and IT capabilities, resources and commitments that spans all three pillars or approaches—regulative, normative and cognitive—to understanding organisational processes and structures (Scott, 1995). In extending and elaborating upon extant treatments of the resource-based view (see, for example, Wheeler 2002 and Wade & Hulland 2004), this paper’s theoretical model and

---

<sup>2</sup> The entire research monograph, including case study narratives and extended analysis is available from <http://afis.ucc.ie/tbutler/PhD.htm>

associated framework presents IS researchers with a comprehensive perspective on the development and application of capabilities and resources in organizations. For example, the model's behavioural theory component views IT professionals and organizational actors as intentional, purposeful entities who commit themselves to particular courses of action as part of socially constructed 'communities-of-practice'. Furthermore, the theoretical model and its associated research framework illustrates that an understanding of the institutional and organisational mechanisms which shape and influence knowledge construction in social contexts, and of the commitments which shape and influence the development and application of such knowledge, is vital if the capabilities of IT professionals—core, enabling and supplemental—that are used to build and leverage IT resources to deliver valuable services are to be fully comprehended and explained.

In conclusion, the outcome of this paper's integration and elaboration of institutional theory from economics and sociology has, we believe, resulted in a logically consistent theory, model and framework that helps explain better the processes by which IT capabilities and resources are developed and applied in organisations. It therefore provides a foundation for future academic research on this important topic.

## References

- Andreu R. and C. Ciborra (1996). Organisational learning and core capabilities development: the role of IT. *Journal of Strategic Information Systems*, 5, 111-127.
- Benbasat, I. and Zmud, R.W. (2003). The Identity Crisis in the IS Field: Defining and Communicating the Disciplines Core Properties. *MIS Quarterly* 27 (2), 183-194.
- Bharadwaj, A. (2000). A Resource-Based Perspective on Information Technology Capability and Firm Performance: An Empirical Investigation. *MIS Quarterly*, 24 (1), 169-196.
- Butler, T. (1998). Towards a hermeneutic method for interpretive research in information systems. *Journal of Information Technology*, 13 (4), 285-300.
- Butler, T. (2002). Building IT Resources in Post-Industrial Organizations: Cases on the Development and Application of IT Competencies. Unpublished PhD Thesis, University College Cork, Ireland (<http://afis.ucc.ie/tbutler/PhD.htm>).
- Checkland, P. and Holwell, S. (1998). *Information, Systems and Information Systems: Making Sense of the Field*. John Wiley and Sons Ltd., Chichester, UK..
- DiMaggio, P.J. and Powell, W.W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48, 47-60.
- Fransman, M. (1998). Information, Knowledge, Vision, and theories of the Firm. In *Technology, Organisation, and Competitiveness: Perspectives on Industrial and Corporate Change*, (Dosi, G. Teece D.J. and Chytry J. Eds) Oxford University Press Inc., New York, NY, 147-192.
- Hamel, G. and Prahalad, C.K. (1994). *Competing for the Future*, Harvard Business School Press, Boston, MA.
- Hayek, F.A. (1945). The use of knowledge in society. *American Economic Review*, 35, 519-532.
- Henderson, J.C. and Venkatraman, N. (1993). Strategic Alignment: Leveraging Information Technology for Transforming Organisations. *IBM Systems Journal*, 20 (1), 4-16.
- Knudsen, C. (1994). The Competence View of the Firm: What Can Modern Economists Learn from Philip Selznick's Sociological Theory of Leadership. In *The Institutional Construction of Organisations: International and Longitudinal Studies*, (Scott W.R. and Christensen S. Eds.), Sage Publications Inc., Thousand Oaks, California, 135-163.

- Leonard-Barton, D. (1995). *Well-Springs of Knowledge: Building and Sustaining the Sources of Innovation*. Harvard Business School Press, Boston, MA.
- Mata, F.J., Fuerst, W.L. and Barney, J.B. (1995). Information Technology and Sustained Competitive Advantage: A Resource Based Analysis. *MIS Quarterly*, 9 (4), 487-505.
- Nanda, A. (1996). Resources, Capabilities and Competencies. In B. Moingeon and A. Edmondson, *Organizational Learning and Competitive Advantage*, Sage Publications Ltd. London, 93-120.
- Nelson, R.R. (1994). Why Do Firms Differ and How Does It Matter? In *Fundamental Issues in Strategy*, (Rumelt, R.P., Schendel, D.E. and Teece D.J. Eds.), Harvard Business School Press, Boston MA., 230-247.
- Nelson, R.R. and Winter, S.G. (1982). *An Evolutionary Theory of Economic Change*. The Belknap Press of Harvard University Press, Cambridge, MA.
- Nonaka, I. and Takeuchi, H. (1995). *The Knowledge Creating Company*. Oxford Press University, New York, NY.
- Nordhaug, O. (1994). *Human Capital in Organisations: Competence, Training and Learning*. Oxford University Press, New York.
- Penrose, E. (1959). *The Theory of the Growth of the Firm*. Basil Blackwell, London.
- Perrow, C. (1984). *Normal accidents: living with high-risk technologies*. Basic Books, New York, NY.
- Priem, R.L. and Butler, J.E. (2001). Is The Resource-Based 'View' a Useful Perspective for Strategic Management Research? *Academy Management Review*, 26 (1), 22-40.
- Rumelt, R.P. (1984). Towards a strategic theory of the firm. In R. B. Lamb (ed.) *Competitive Strategic Management*, Prentice Hall, Englewood Cliffs, NJ, 556-570
- Scott, W.R. (1995). *Institutions and Organizations*. Sage Publications Ltd., Thousand Oaks, CA.
- Selznick, P. (1957). *Leadership in Administration: A Sociological Interpretation*, Harper and Row, NY.
- Selznick, P. (1949). *TVA and the Grass Roots*. University of California Press, Berkeley and Los Angeles, CA.
- Teece, D.J., Pisano G. and Shuen, A. (1990). Firm Capabilities, Resources and the Concept of Strategy. CCC Working Paper No. 90 8, University of California at Berkeley, CA.
- Teece, DJ and Pisano, G. (1998). The Dynamic Capabilities of Firms: An Introduction. In *Technology, Organisation, and Competitiveness: Perspectives on Industrial and Corporate Change*, (Dosi, G. Teece D.J. and Chytry J. Eds), Oxford University Press Inc., New York, 17-66.
- Ulrich, D. (1998). Intellectual Capital = Competence X Commitment. *Sloan Management Review* 39 (2), 15-26.
- Wade, M. and Hulland, J. (2004). The Resource-Based View and Information Systems Research: Review, Extension and Suggestions for Future Research. *MIS Quarterly*, 28 (1), 107-142.
- Wheeler, B.C. (2002). NEBIC: A Dynamic Capabilities Theory for Assessing Net-Enablement. *Information Systems Research*, 13 (2), 125-146.
- Williamson, O.E. (1998). Transaction Cost Economics and Organization Theory formation, Knowledge, Vision, and theories of the Firm. In *Technology, Organisation, and Competitiveness: Perspectives on Industrial and Corporate Change*, (Dosi, G. Teece D.J. and Chytry J. Eds), Oxford University Press Inc., New York, NY, 17-66.
- Winograd T., and Flores, F. (1986). *Understanding Computers and Cognition: A New Foundation for Design*. Ablex Publishing Corporation, Norwood, NJ.