December 1999

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SHAPING INFORMATION AND COMMUNICATION TECHNOLOGIES INFRASTRUCTURES IN THE NEWSPAPER INDUSTRY: CASES ON THE ROLE OF IT COMPETENCIES

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Ciaran Murphy  
University College Cork  
Ireland

Abstract

This paper proposes an integrative theoretical model, drawn from the competence-based view of the firm in institutional economics and sociology, in order to examine the emergence of IT competencies as a key component of organizational distinctive competence in knowledge-intensive firms. In so doing, it addresses the paucity of in-depth empirical research on the role of IT competencies in building information and communication technology (ICT) infrastructures. A conceptual framework drawn from the model is employed to test its empirical validity in two exploratory case studies of firms operating in the newspaper industry. Firms in this industry are information and knowledge intensive; consequently, their core business processes have increasingly become dependent on IT—so much so that competency in the planning, design and delivery of IT architectures has become the sine qua non for competitive success. The organizations studied—News International Newspapers Ltd. and Examiner Publications Ltd.—are industry leaders in the application of ICT in the United Kingdom and Ireland. They offer particularly fruitful examples of the phenomenon of interest. In providing empirical support for the proposed theoretical model, this paper makes a contribution to theory in the quoted referent disciplines. It also provides a theoretically-grounded, in-depth description of the key role that IT competencies play in the commercial success of today’s knowledge-intensive firms.

Keywords: Knowledge, commitment, distinctive competence, information technology, competitive advantage

1. INTRODUCTION

The newspaper business is the archetypal knowledge industry. Today, as 100 years ago, the raw material of this industry is information, gathered from multifarious knowledgeable sources and processed using the experiential knowledge and skills of newspaper journalists, editors, copy editors, imaging specialists, printers, etc. Information and communication technologies (ICT) now play a pivotal role in the manner in which newspaper firms gather, process, store, and embed their informational resource in newspaper products. More importantly, it is the IT-related competencies of a new breed of newspaper worker—the IT professional—that constitute the key ingredients in the design, implementation, and delivery of IT architectures and services that enable and empower “knowledge workers” in these organizations. The two cases selected for study—United Kingdom-based News International Newspapers Ltd. and Irish-based Examiner Publications Ltd.—provide graphic examples of the key role that IT competencies play in the commercial success of today’s knowledge-intensive firms.
This paper proposes a theoretical model drawn from the competence-based view of the firm in institutional economics and sociology to examine the emergence of IT competencies as key components of organizational distinctive competence in knowledge-intensive firms. Following calls made by Williamson (1998) and Knudsen (1994), the model incorporates a set of descriptive microanalytic attributes that define the phenomenon of distinctive competence while also including a process-based dimension that helps explain how organizational knowledge translates into distinctive competence. 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 analytic components. A conceptual framework drawn from the model is applied to examine and describe the competence profile of two highly successful newspaper publishers who, it is argued, possess a distinctive competence in their commercial undertakings. This study provides valuable insights into IT competence development in knowledge-intensive firms by recounting the experiences of these organizations in developing their ICT infrastructures.

The remainder of this paper is organized as follows. The next section examines the concept of distinctive competence as it is articulated in various theories of the firm and proposes a theoretical model and a conceptual framework drawn from that model which is then employed to examine the phenomenon in two organizations. This study’s research philosophy and strategy are then outlined. Section four describes and analyzes the cases within the context of the framework, while the final section discusses this paper’s implications and offers several conclusions.

2. IT COMPETENCIES AND THEORIES OF THE FIRM

The theoretical foundation of the present study emanates from institutional theory in both economics and sociology. The conceptual components of the theoretical model presented below have been the subject of debate in these disciplines for some time, yet there have been few attempts to integrate what are complementary perspectives on organizational behavior into an overarching framework (for examples, see Powell and DiMaggio 1991; Knudsen 1994; Williamson 1998). The aim of this section is to provide a rationale for the theoretical model presented herein prior to its application.

3. AN INSTITUTIONAL PERSPECTIVE ON DISTINCTIVE COMPETENCE

The concept of distinctive competence was developed by Phillip Selznick in his seminal work Leadership in Administration. Here, Selznick (1957) argued that it is the various commitments entered into by organizational stakeholders that defines an organization’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 behavioral acts in the pursuit of organizational objectives. 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 organizational 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 organization, that social actors influence organizational 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 organizations and helps bestow a distinctive competence upon them. Knudsen (1994) contends that the deficiencies in extant competence-based perspectives (in adaptionist sociological theory and in equilibrium-based economic theory) are augmented by Selznick’s institutional theory in that it captures the dynamics of the continuous exchange between an organization’s latent competencies and its structures and processes; here competence, structure and process are viewed as an expression of a firm’s accumulated knowledge and a consequence of human design. Selznick’s (1957) theory is, therefore, proposed as a suitable process-based perspective to augment the outcome-centric view of organizational competence prevalent in the literature. While this focus on process answers some of the problems with the extant competence-based view of the firm, there is the task of uncovering what Williamson (1998) referred to as microanalytic attributes, which may be used as a conceptual vehicle for the analysis of organizational distinctive competence. This challenge is now addressed.
Table 1. Taxonomy of Organizational Commitments

<table>
<thead>
<tr>
<th>Type of Commitment</th>
<th>Description</th>
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<tr>
<td>Commitments enforced by uniquely organizational imperatives.</td>
<td>Organizational imperatives are concerned with 'reality' maintenance. They are usually implemented by policy decisions associated with system maintenance; consequently, they ensure that the organizational requirements of order, discipline, unity, defense, and consent are fulfilled.</td>
</tr>
<tr>
<td>Commitments enforced by the social character of the personnel.</td>
<td>The personnel, or so-called human capital, in organizations come to a 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 organization by its personnel.</td>
</tr>
<tr>
<td>Commitments enforced by institutionalization.</td>
<td>Because organizations 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 behavioral standards.</td>
</tr>
<tr>
<td>Commitments enforced by the social and cultural environment.</td>
<td>Organizational policies and outcomes are often influenced and shaped by actors in the external social and cultural environment.</td>
</tr>
<tr>
<td>Commitments enforced by the centers of interest generated in the course of action.</td>
<td>Decentralization and delegation of decision making to particular individuals and groups within an organization 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 organization.</td>
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</table>

2.2 Distinctive Competence and Economic Theories of the Firm

The origins of the competence-based perspective in institutional economics are to be found in ideas developed by Penrose (1957). For Penrose, the firm is conceived as a collection of competencies that embody its knowledge. Following Hayek (1945), Penrose argued that a firm’s competitive position was dependent on the manner in which the experience and knowledge of its personnel was developed and leveraged. The view of organizations as “repositories of productive knowledge” was expanded upon by Nelson and Winter (1982; p. 175), who argued that an organization’s productive knowledge is to be found in its operational routines. For Nelson and Winter, routines allow organizations to cope with complexity and uncertainty under the conditions of bounded rationality; in addition, they provide an efficient way of storing an organization’s accumulated knowledge. Finally, Nelson and Winter argue that routines are the basis of a firm’s distinctiveness and are also the source of its competitiveness. Teece, Pisano and Shuen (1990) build on the foundations provided by Penrose and by Nelson and Winter and propose a dynamic capabilities perspective that considers a firm’s distinctive competence as being the embodiment of the collective knowledge of organizational actors (Tables 2 and 3 provide a comprehensive overview of these related concepts). While this conceptualization 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 a firm’s distinctive competence. Here, Teece and Pisano present a set of firm-based descriptive factors that (1) include organizational and managerial processes; (2) provide an indication of the firm’s current strategic and operational position; and (3) delineate the paths taken to its present position and provide an indication of potential future positions. In many respects this framework provides an answer to Williamson’s call for a set descriptive microanalytic attributes to help researchers conceptualize and understand better the phenomenon of distinctive competence.

Having introduced each of the concepts of interest, an integrative model of organizational distinctive competence may now be proposed (see Figure 1). Unlike previous conceptualizations, this model is process-based and also captures comprehensively the multi-faceted nature of the phenomenon. The model’s conceptual foundations are described in some detail in Tables 1, 2, and 3, while the following subsection describes the model’s utility and relevance to this study on the contribution of IT competencies to the formation of organizational distinctive competence in the 21st century.
Table 2. An Analysis of Organizational Knowledge and Distinctive Competence

<table>
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<tr>
<th>Concept</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Organizational Knowledge</strong></td>
<td>➢ Knowledge is a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information....In organizations, it often becomes embedded not only in documents and repositories but also in organizational routines, processes, practices and norms” (Davenport and Prusak 1998, p. 5).</td>
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<tr>
<td></td>
<td>➢ Knowledge is processed information, the purpose of which is to facilitate action by social actors (Davenport and Prusak 1998).</td>
</tr>
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<td></td>
<td>➢ Knowledge is socially distributed (Hayek 1945).</td>
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<td></td>
<td>➢ Knowledge consists of self- or experiential knowledge (<em>phronesis</em>) and skill-based or technical knowledge (<em>techne</em>) (Aristotle; Gadamer 1975).</td>
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<tr>
<td></td>
<td>➢ Knowledge is both tacit (incapable of articulation) and explicit (capable of articulation) (Nonaka and Takeuchi 1995; Polanyi 1962, 1975).</td>
</tr>
<tr>
<td></td>
<td>➢ The notion of tacit knowledge is useful in an organizational context only to the extent that it alerts one to the existence of embedded knowledge (see Tsoukas 1996; cf. Heidegger 1976).</td>
</tr>
<tr>
<td></td>
<td>➢ “Communities of practice” are socially constructed to integrate and disseminate organizational knowledge in particular fields of knowing (Brown and Duguid 1991; Tsoukas 1996).</td>
</tr>
<tr>
<td><strong>Distinctive Competence</strong></td>
<td>➢ Competence is a characteristic that governs an individual’s ability to respond to his/her environment (White 1959).</td>
</tr>
<tr>
<td></td>
<td>➢ Competence is a function of individual (experiential) knowledge, skills, and aptitudes (Nordhaug 1994).</td>
</tr>
<tr>
<td></td>
<td>➢ Competence is a bundle of skills and technologies rather than a discrete skill or technology (Hamel and Prahalad 1990).</td>
</tr>
<tr>
<td></td>
<td>➢ Unique or distinctive competence is high in task and firm specificity and hence difficult to imitate (Nordhaug 1994).</td>
</tr>
<tr>
<td></td>
<td>➢ Competencies that act in support roles are meta-competencies, technical competencies, industry competencies, technical trade competencies and intraorganizational competencies (Nordhaug 1994).</td>
</tr>
</tbody>
</table>

2.3 The Role of IT Competencies in Shaping Organizational Distinctive Competence: Research Objective and Questions

Information technology (IT) has moved from the periphery to the center of everyday business and social life and plays a pivotal role in the transformation of organizations (Scott-Morton 1991). Zuboff (1988), for example, provides a fascinating account of the power of IT to reconfigure the nature of work and the social relationships that organize productive activities. Now, at the turn of the 21st century, it is an accepted conventional wisdom that knowledge-intensive firms need to leverage IT in an innovative manner if they are to empower their human and intellectual capital, tap valuable firm-specific knowledge resources, integrate and disseminate such knowledge, and thereby develop a distinctive competence (Davenport and Prusak 1998; Hamel and Prahalad 1994). Of import to the present study is that there is a paucity of theoretically-grounded empirical research in the area of IT competencies and, in particular, studies that describe the relationship between the development of such competencies and the emergence of distinctive competence in organizations (for examples, see Andreu and Ciborra 1996; Feeny and Willcocks 1998; Ross, Beath and Goodhue 1996).
### Table 3. The Microanalytic Attributes of Organizational Distinctive Competence  
(Adapted from Teece and Pisano 1998)

<table>
<thead>
<tr>
<th>Microanalytic Attributes</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Organizational and Managerial Processes</strong>&lt;br&gt;<strong>Describes the patterns of current practice and learning in a firm, tangible evidence of which is to be found in its routines.</strong></td>
<td><strong>Integration:</strong> Concerns itself with efficient and effective internal coordination of organizational activities. Differences in firm-specific coordinative routines are argued to have a significant impact in development cost, lead times, and quality among firms. <strong>Learning:</strong> Learning is a process whereby repetition and experimentation enable tasks to be performed better and more rapidly; it also helps new production routines to be identified (Levitt and March 1988). Learning occurs at the individual and organizational level. Nordhaug (1994) distinguishes between informal (part of the socialization process in organizations) and formal (through training, education, etc.) learning. Teece and Pisano (1998) report that interorganizational learning takes place through collaborations and partnerships. <strong>Reconfiguration and Transformation:</strong> According to Teece and Pisano (1998), the capacity to reconfigure the firm’s asset structure is itself a learned organizational competence. The ability to reconfigure and transform ahead of the competition, and at low cost, is a key aspect of a firm’s distinctive competence.</td>
</tr>
<tr>
<td><strong>Positions</strong>&lt;br&gt;<strong>Indicated by a firm’s current 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 suppliers.</strong></td>
<td><strong>Technological Assets:</strong> The standard instruments of intellectual property law may or may not protect a firm’s use of technological assets. However, it is clear from Nordhaug (1994) that if assets are highly firm and task specific then they may be considered unique and difficult to imitate, whatever the property rights situation. It is clear, also, that if the knowledge that created such assets is also proprietary and firm specific, then this adds a further ring of protection (Jensen and Meckling 1995). <strong>Complementary Assets:</strong> The development of new products and services, or the mechanisms by which they are to be delivered, depends on the use of certain related assets. Such assets are considered complementary and typically have uses beyond their immediate function. <strong>Financial Assets:</strong> What a firm can do in terms of reconfiguration and transformation is often a function of the state of the balance sheet. A firm’s cash position and degree of financial leverage is a strategic issue. Experiential knowledge and skills in financial management are key issues here. <strong>Locational Assets:</strong> A firm’s location 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.</td>
</tr>
<tr>
<td><strong>Paths</strong>&lt;br&gt;<strong>These are the strategic alternatives available to the firm (which are a function of past activities and positions) and its future strategic possibilities.</strong></td>
<td><strong>Path Dependencies:</strong> A firm’s present position in the market is a function of its past performance and future possibilities. A firm’s past investments and present repertoire of productive routines can enable or constrain (see Leonard-Barton 1992 on “core rigidities”). Learning is a process of trial, feedback, and evaluation; if past behaviors have limited or attenuated any of these activities, then it may prevent the creation of firm-specific knowledge, competencies and assets. <strong>Technical Opportunities:</strong> The recognition of technological opportunities is often down to internal and external organizational and institutional structures, collaborations and knowledge links. High cost R&amp;D may deter some firms from realizing such opportunities; in others, the experiential knowledge or lack thereof may also be a constraint. Firms in the same industry face different menus of opportunities and choices; quite often it is the idiosyncratic experiential knowledge of firms that guides them in choosing the most appropriate and feasible of opportunities and in developing competencies in their skills-base that allow them to realize such opportunities.</td>
</tr>
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</table>
2.3.1 Research Objective

Given the foregoing observations, the primary objective of this exploratory study is to deepen the IS field’s understanding of the role that IT competencies play in shaping the knowledge-intensive organization’s distinctive competence. In order to achieve this objective, a model is generated from the conceptual frameworks presented in Tables 1, 2, and 3. An integrative conceptual framework is drawn from the model and is employed to generate several research questions that will help to comprehensively investigate the phenomenon of interest.

2.3.2 Research Questions

This paper argues that firms are distributed knowledge systems (Tsoukas 1996) where social groupings constitute “communities of practice” (Brown and Duguid 1991); these “communities of practice” and their enabling information technologies are said to be socially constructed (Fulk 1993; Checkland and Holwell 1998) by the commitments entered into by social actors (Selznick 1957). Questions, therefore, arise as to the role of the IT function (itself a “community of practice”) in providing information systems with the required systemic competencies (Henderson and Venkatraman 1993) to enable knowledge transfer and competence development in core business functions so that the organization as a whole develops a distinctive competence. All this leads to the following research questions, which are placed within the context of the conceptual framework indicated by the model presented in Figure 1.

RQ1: How did the IT functions in the firms studied give form to and shape the path dependencies exhibited by each and help realize the technical opportunities presented?

RQ2: What special role did these firms’ IT human resource play in creating firm-specific technological, complementary, financial and locational assets?
RQ3: What commitments defined each organization’s character in order to bestow upon it a distinct competence and how did the commitments entered into by each firm’s IT function contribute to this?

RQ4: How did the organizational and managerial processes in the firms studied benefit in terms of integration, learning and reconfigurability and transformability from the innovative and competent application of information technologies by their IT functions?

A research approach that helps realize the stated research objective and answer the research questions posed is now articulated.

3. RESEARCH PHILOSOPHY, STRATEGY AND METHOD

The previous section of this paper argued that organizations and their enabling technologies are socially constructed. This perspective is implicit in the competence-based view of the firm: hence, a constructivist approach to research is adopted for the present study. In keeping with prescriptions of the constructivist paradigm and the hermeneutic method it employs, a qualitative, interpretive, case-based research strategy was adopted for the study (see Butler 1998; Guba and Lincoln 1994). This strategy involved an exploratory, instrumental, collective case study that was undertaken to obtain particular insights into the phenomenon of IT competencies as an integral component of organizational distinctive competence (Stake 1994). The case design utilized has been described by Yin (1989) as “post-hoc longitudinal research.” Central to the execution of the research strategy was the constructivist notion of the researcher as human instrument (Lincoln and Guba 1985).

3.1 Site Selection, Data Sources and Analysis

News International Newspapers Ltd. and Examiner Publications Ltd. were purposefully selected for study because, as industry leaders in the adoption of new technologies to support their core business processes, both firms had achieved competitive success in their chosen markets in the United Kingdom and Ireland.

Research into each case was conducted through the use of individual interview and documentary sources. A total of 32 formal interviews took place with key social actors from several different “communities of practice” within the organizations studied, including, of course, their IT functions. Each interview was tape-recorded and lasted up to two hours. There was also considerable informal contact with social actors in both firms as the study was conducted over a period of several months.

The conceptual research framework described previously provided the researcher with the required hermeneutic pre-understanding of the phenomena studied so that the findings could be more readily interpreted and understood. Socratic, Hegelian and Reductionist Dialectic approaches (see Butler 1998) were employed within the context of the framework to identify the whole/part relationships that existed between the framework components and the phenomenon of interest in order to explain and understand it (see Butler 1998; Davis et al. 1992). These dialectic approaches were operationalized using the qualitative data analysis techniques of content and constant comparative analysis, as they provided the necessary mechanisms for the required structural analysis of the data (Calloway and Ariav 1991; Patton 1990). Triangulation techniques were also extensively employed to provide insights into events, relationships, etc. between primary data sets (Erlandson et al. 1993; Patton 1990). The framework acted also as a descriptive matrix that was used to present and analyze the data in a condensed format; extended narratives were employed to provide additional detail and context.

4. THE CASES: INNOVATIVE ICT INFRASTRUCTURES AND IT COMPETENCIES IN THE NEWSPAPER INDUSTRY

The first case studied is that of Rupert Murdoch’s United Kingdom-based News International Newspapers Ltd. In the mid-1980s, News International Newspapers played a pivotal role in changing the character of the newspaper industry in Great Britain and Ireland. The manner in which Murdoch introduced IT-enabled change to his United Kingdom paper business—which includes, for example, The Times, The Sunday Times, The Sun and The News of the World—radically altered the character of his
organization. The process of change was bitter and led to major riots between former employees—mainly printers/compositor/typesetters and ancillary staff—and police outside his new plant in the docklands of East London. Thirteen years on, Murdoch’s newspapers are the market leaders in the British Isles. The reasons for this success can be directly attributed to the development of IT-enabled distinctive competence in its editorial, advertising, printing and distribution processes.

The second case examined is that of Examiner Publications Ltd., a major player in the Irish publishing industry. Examiner Publications was one of the first newspaper businesses to introduce IT to support its core business processes. In 1976, for example, a computer-based IS was introduced to help automate parts of the typesetting process. This system was upgraded and expanded in 1986, and full IT support for Examiner’s information acquisition, editorial and advertising, printing and distribution processes was effected in the mid-1990s. This leveraging of IT to enable its core business processes helped the company effect a change in its business strategy that saw its regional daily broadsheet publication, The Examiner, become a major national newspaper, and its local evening newspaper, The Echo, become a major regional player. In both cases, IT competencies developed over time; however, driven by competitive issues and technological advancements, these competencies grew at an accelerated rate over the last five years as IT became a key resource and part of the organizations’ distinctive competence profile.

4.1 Navigating Path Dependencies and Realizing Technical Opportunities in the Cases (RQ1)

Prior to the radical transformation of the newspaper industry in the British Isles, the process by which all major British and Irish newspaper publications were produced had not changed since the nineteenth century. As a result, British and Irish newspaper organizations were considered to be grossly over-manned, labor-intensive, and inefficient (see McNair 1996; Tunstall 1996). A similar situation prevailed in the Irish newspaper industry where the same trade unions—chiefly the National Graphics Association (NGA) and the National Union of Journalists (NUJ)—held the balance of power. The exercise of labor union power, which effectively stymied all IT-related change, was at the source of the “core rigidities” that maintained the inefficient organizational routines, work practices that had grown around the obsolete technologies used to produce newspapers and shaped the core business processes of the day. In terms of the present analysis, established “communities of practice”—consisting of typesetters, printers, and journalists—strenuously resisted any change to or destruction of existing competencies in these communities by making obsolete their experiential knowledge and skills. The following path dependency analysis examines the change to organizational and managerial processes and positions within a historical context. In both organizations, the “core rigidities” mentioned were overcome in order to realize the technological opportunities presented by new ICT. This analysis examines the impact that ICT had on both firms’ core business processes during their initial period of transformation and reconfiguration.

In News International and Examiner Publications there is a direct relationship between the form and content of core business processes and the asset positions and technological opportunities presented to the companies concerned. In 1986, both organizations reconfigured and transformed several of their core business processes using IT. For example, new computer-based editorial systems replaced the labor-intensive manual paper-based editorial process in place at News International, while Examiner upgraded its existing, but dated, computer-based system. Editorial staff were now able to single-key newspaper copy into these systems, the output of which was column-wide, light-sensitive bromide paper strips or galleys. During the composition process, the galleys were cut and pasted along with graphics images in bromide format onto page-sized boards; these were employed to make aluminum printing-plates for the printing presses. The appearance of Mac-based graphics software meant that photos and other graphical images could be electronically processed and stored as apart of the imaging process. This brought considerable innovation to the process of producing color-based images in order to enhance product quality. In the mid- to late 1980s, the appearance of new IT such as PCs and laptop computers, cellular phones, modems, e-mail, communication and file transfer technologies, leased data lines, and satellite technologies greatly enhanced the information gathering process in both firms. In 1976, Examiner Publications revolutionized its production process and introduced color web-offset printing presses; News International did so in 1986. It was about this time also that News International began to augment its distribution process using IT to transfer copy electronically to its plants in Glasgow and Liverpool. Like Examiner Publications, it continued to transport its product by road using one of Rupert Murdoch’s own companies. However, it wasn’t until the 1990s that the advertising process in these firms began to receive support and enablement by IT. What must be noted here is that it was News International who first institutionalized commitment to the introduction of IT and radically changed its organizational and managerial processes. True, Examiner introduced IT to enable its core business processes in 1976 and 1986, but its management failed to reorient the
commitments of its workforce: consequently, it failed to realize the technological opportunities presented to it and ended up automating the existing inefficient business processes.

In terms of technological assets, both companies had, by the mid-1990s, acquired state-of-the-art IT and production systems. To varying degrees, both firms were also able to leverage disparate IT systems and pre-press and press technologies as complementary assets to decrease production times and increase product quality. With the move to Wapping, and associated process improvements, and the sale of its Fleet Street properties in the City, News International acquired a healthy balance sheet and significant financial assets. Examiner’s fortunes were on the wane, due to mismanagement of its technological and human assets, and by 1990 its balance sheet was in the red. Post-Wapping, News International was able to regionalize its production facilities and thus enhance its locational assets using IT as an enabler. By the end of the decade, the strength of its titles had grown; so too had advertising revenues and customer loyalty. The downturn in the Irish economy meant that Examiner Publications’ titles had begun to decline: its location now became somewhat of a liability. In any event, the learning experiences of the fledgling IT functions in these firms provided their IT people with the necessary experiential knowledge and skills to tackle the significant IT-related change that would occur in both firms in the mid- to late 1990s.

4.2 Analyzing the Relationship between IT Competencies and Distinctive Competence (RQ2-4)

In the mid- to late 1990s, both organizations underwent further significant IT-related change which transformed their core business processes. A cadre of seasoned IT professionals existed in both firms. In 1994, for example, News International had an IT complement of just 20 for an operation with some 3,000+ employees, while Examiner Publications had just five for an operation with under 400 people. Senior management in both organizations was aware of the potential of IT to transform both process and product. In 1994, following News International’s lead, Examiner Publications used ICT to radically transform and reconfigure its methods of operation. By 1999, both organizations employed new groupware-like Windows-based technologies that gave editorial staff the WYSIWYG and collaborative capabilities to produce full pages online. Further developments in graphics and imaging technologies and related application software meant that newspapers could now be more visually stimulating. Both developments saw editorial and image personnel share experiential knowledge and develop new computer-based skills in innovative ways. Vendors of publishing software were also producing systems that integrated advertising and editorial processes. New advertising systems automated much of the classified ad sales process. For example, they allowed telesales staff to create ads online and have them priced by the system, and they provided much-needed linkages to credit control; more importantly, however, was the ability to place the ad on the digital copy of the desired newspaper edition. Developments in ICT also rendered obsolete the labor intensive composition process (now referred to as the pre-press process). The postscript files and images produced by existing editorial systems could now be translated into bitmap format and passed to image processors, which would produce the full-size photographic negatives used to produce printing press plates. However by 1999, News International was using IT to enable “computer-to-plate” at one of its plants and thereby eliminate the need for expensive pre-press image processors. During this period, new media, particularly the Internet, were embraced enthusiastically by the business and IT functions in both organizations, who in a short period of time developed considerable knowledge and skills in web-based publishing in order to protect and augment existing advertising revenue streams. High speed/bandwidth communication technologies now enabled digital versions of newspapers to be transmitted to remote printing plants to speed up delivery times. By the end of the decade, both organizations realized in full the benefits of these technologies and are industry leaders in this regard. An analysis of these organizations’ distinctive competence with a particular focus on the knowledge and competencies of their IT human resource and the process by which knowledge is transformed into competence is presented in Figure 2. This helps answer research questions 2 and 3. Table 4 focuses on research questions 3 and 4 by describing and analyzing Williamson’s (1998) microanalytic attributes in order to highlight the impact of IT competencies on the organizational and managerial processes and asset positions of both firms. This analysis describes organizational distinctive competence by indicating the degree of firm-specificity of processes and assets in the organizations studied. Thus, the contexts, content, and process that led to the development of distinctive competence in these firms have been described. The final section of this paper offers some insights into the ramifications of this paper’s investigation of this phenomenon.
Organizational Knowledge—of IT and its capabilities

The key IT actors in these organizations have developed experiential knowledge in:

- Newspaper operations and core business processes
- New and emergent ICT and their application through learning and experimentation
- The application of a diverse range of core technologies such as operating systems and database management systems, high speed LAN and WAN technologies
- Development and operation of robust firm-specific ICT infrastructures that are general-and industry-specific.
- Enabling inter-organizational knowledge transfers by OEMing proprietary technologies
- Effecting knowledge transfers within and across diverse vendors in the IT and publishing industries.
- Leveraging business knowledge and integrated this with existing IT knowledge in the web-based development of these firms’ major titles

Organizational Commitment

Commitments Engendered by:

Organizational Imperatives: The dominant organizational imperative in both organizations has been to leverage the automating and informating capabilities of ICT in order to maximize the efficiency and effectiveness of their business processes, product and quality

Social character of the personnel: Individuals are now more open to and accepting of change. The influx of young, ambitious, well-educated newspaper workers and IT professionals has seen individual commitment to organizational ends dominate the attitudes of “communities of practice” within the organizations studied.

Institutional Arrangements: There is visible commitment to institutionalized patterns of behavior and to behavioral patterns and flexibility of work practices. This is effected by close formal and especially informal, collaboration between management, unions and individuals.

The social and cultural environment: It is clear from this study’s empirical evidence that the growth of individualism in Western culture has shifted the focus of individual commitment and expectations regarding change. The need to look towards broader institutional frameworks to shape and influence individual commitment has therefore been obviated.

Sectional Interests: The changing nature of society, external institutions, the all pervasive impact of IT, and the impact of such factors on “communities of practice” within the firms studied has minimized the occurrence and influence of tangential informal goals in individuals and sectional interests that would otherwise run counter to the attainment of overall organizational objectives.

Firm-specific IT competencies that fall under the general headings of:

- The capability to inform and lead business vision in the innovative application of IT
- The ability of the IT people to integrate into and be accepted by the business community
- The ability to build on existing IT knowledge and skills to plan firm-specific ICT infrastructures
- The ability to recognize the potential of emergent technologies and make them firm-specific through technological and processual customization
- The ability to integrate a diverse range of hardware and software technologies across all business processes
- The ability to evolve present ICT to keep them firm-specific
- The ability to choose appropriate ICT vendors and develop strong relationships that facilitate intraorganizational learning and knowledge transfers

Distinctive Competence—an IT Competencies view

Figure 2. The Role of Commitment in Knowledge and Competence Formation (RQ 2&3)
Table 4. The Impact of IT Competencies on Firm-specific Processes and Asset Positions: An Analysis of Microanalytic Attributes (RQ 3&4)

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<th>Organizational and Managerial Processes</th>
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<td><strong>Integration:</strong> ICT now automates and informs the information gathering editorial, advertising, imaging, composition, production and distribution processes in both firms. ICT has enabled the extension of the editorial, imaging, pre-press and production process to national and international locations. Firm-specific, production routines have been embedded in patterns of work supported by ICT. Organizational standards in terms of process and product can be implemented and controlled, while group problem solving, with concomitant inter- and intra- “community of practice” learning is either directly provided by these new technologies or such ICT provide an occasion for learning.</td>
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<td><strong>Learning:</strong> The repetition and experimentation of tasks by both business and IT “communities of practice” has enabled many business activities to be performed better and more rapidly and has helped new production routines to be identified. A high incidence of informal, on-the-job learning was in evidence among IT professionals and prior experience as members of the business community greatly benefitted IT competence formation. There is now major emphasis on experimentation, especially in relation to new untried technologies, prior to implementation. Interorganizational learning has taken place in and between both these firms and through collaborations and partnerships with vendors.</td>
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<td><strong>Reconfiguration and Transformation:</strong> ICT has been both the enabler and occasion for formal change in these organizations’ contexts, structures, and processes. The distributed nature of News International’s production and distribution process and the flexible nature of its ICT means that if a problem arises with production at one plant, then another can take up the slack. The ability of IT to monitor, control, and dynamically reconfigure production resources gives it a significant competitive advantage. The ability to reconfigure and transform ahead of the competition, and at low cost, is a key aspect of both firms’ distinctive competence.</td>
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<td><strong>Technological Assets:</strong> Examiner Publications was the first in Ireland to employ computer-based IS to support its core process; it still is an industry leader in terms of the application of ICT, and now in web-based development. Because of Examiner’s particular IT competencies, News International entered into a lucrative partnership with it to produce the Irish editions of The Times and The Sunday Times. Examiner has benefitted from this experience as it now uses the same technology to print the editions of some of its regionally-based group newspapers. News International’s ICT is state-of-the-art: two Sun Starfire 10000 multi-processor computer systems are used as its core computing engines, these are ringed by multiple NT-based application servers and are interconnected by an ATM fiber-based LAN and WAN network to 14 other printing sites. Leading-edge software applications have also been employed to enable core business processes. Without exception, each major hardware platform and their software applications have been more-or-less OEMed to make them unique and firm-specific. Ultimate control over core IT functionality resides in-house.</td>
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<td><strong>Complementary Assets:</strong> The development of complementary new products and services, such as web-based publishing and, in News International’s case, an Internet service provision, lies at the core of these firms’ IT strategies. On the other hand, complementary assets that range from geographically-based print operations to diverse in-house hardware platforms and systems, to knowledge-workers in different “communities of practice,” have been woven into a coherent overarching system of production that is unrivaled in both companies’ chosen markets.</td>
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<td><strong>Financial Assets:</strong> Both firms now possess extremely favorable balance sheets and asset profiles that will enable them to further leverage new technologies and maintain their competitive positions.</td>
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<td><strong>Locational Assets:</strong> The location of both firms’ plants and proximity to customers and suppliers has had a major influence on their ability to produce and distribute products and services at low cost. Their reputations are, in a sense, embedded in their products as a consequence of the experiential knowledge and capabilities of their knowledge workers. In addition, both firms use the power of ICT to overcome time and space in order to maximize the use and value of their locational assets.</td>
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5. DISCUSSION AND CONCLUSIONS

At a superficial level of analysis, the distinctive competence of both these newspaper organizations is to produce, distribute and deliver a unique, quality product on time and at low cost and that meets the needs of their customers and clients. At a more fundamental level, it is the core business processes that make all this possible and that lie at the heart of these firms’ distinctive
competencies. Nevertheless, it must be noted that a diverse range of committed social actors employ their knowledge and related skills to design, build, and operate the technologies that enable these processes. True, the experiential knowledge and skills of editors, journalists, and image artists play a major role in producing newspapers and supplements that are unique and firm-specific; however, the capabilities these actors employ form only a part of these organizations’ competence profiles. Echoing the findings of recent research by Ross, Beath and Goodhue (1996), the present study illustrates that the competencies of _human IT assets_ played a major role in shaping organizational character and distinctive competence. As with the aforementioned study, technical skills, business understanding, and problem-solving capabilities were seen to underpin the competence of human IT assets; however, not all individuals possessed these capabilities in equal measure. It was clear that certain IT professionals displayed unique competencies, while others possessed industry-based technical trade competencies and more standard technical competencies (see Nordhaug 1994). Individuals with unique competencies were seen to play influential roles in making ICT infrastructures firm-specific; typically, these people tended to be highly motivated members of the business community who made their way into IT during the critical periods of organizational transformation or, alternatively, were IT professionals who played a foundational role in these firms’ IT functions. Such individuals displayed and still display extremely high levels of commitment in applying their experiential knowledge and skills toward organizational ends. In addition, while Examiner Publications maintains a small cadre of IT people with unique and technical trade competencies, the transformation of News International’s business saw the recruitment of IT professionals with standard technical competencies. Using existing IT staff with unique competencies as knowledge anchors, it has been News International’s goal to integrate new members into its IT “community of practice” and to foster competence development through formal and informal means. While formal training enhanced standard technical and technical trade competencies, the development of unique IT competencies in both organizations grew primarily from informal knowledge transfers through a network of sources that included highly experienced colleagues and vendors and from on-the-job learning. In regard to these new entrants, it is clear that the high levels of commitment observed came not because remuneration rates were high in either firm; rather, staff tended to be motivated by the fact that they were working on innovative projects and new technologies and were members of highly committed “communities of practice.”

In conclusion, this paper has made several valuable contributions to research on the related phenomena of distinctive competence and IT competencies. The former has been the topic of study in institutional economics and sociology for some time now; the latter is a relatively new area of interest in the IS field. One major contribution this paper makes is in the presentation of an integrative theoretical model that captures previously unrelated dimensions to the phenomenon of distinctive competence. A conceptual framework based on the model has been presented; the framework aided in the achievement this study’s research objective and has helped answer the research questions posed. In so doing, it has evolved the IT asset-based perspective articulated by Ross, Beath and Goodhue by elaborating a competence-based view on the role played by IT in developing sustained competitive advantage. The competence-based theory articulated herein encompasses the pivotal contribution of commitment as the mechanism whereby the experiential knowledge and skills of IT professionals translates into tangible IT competencies.

6. REFERENCES


