



# Contemporary Influences of Various Recent Theories of the Firm to Information Resources Management Research

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## ABSTRACT

*This paper tries to explore the theoretical foundations of the digital economy. In doing that it discusses first micro-economics – actually the 8 main theories of the firm of the 20<sup>th</sup> century. A reasoning through a literary review is presented and it shows that no other theory of firm explored is suitable for background to the digital economy except the resource-based view of the firm.*

*Starting from this finding the paper further explores the strategic formulations based on the resource-based view of the firm, as well as its implications to organizational learning and competitive advantage created by information resources management.*

*The conclusions suggest that the resource-based view of the firm and its implications to strategic management and information resources management form a solid base for further studies on the foundations of the digital economy. Therefore, the paper suggest that the studies on the digital economy could be more fruitful when studied under the premises of the resource-based theory than any other modern theory of the firm.*

## INTRODUCTION

The overall change in the world business environment is a very radical one, arising from three phenomena: Networking of organizations and their information systems, increasing utilization of market mechanisms in mutual transactions, and a global emphasis on business operations. The organizational structures of enterprises have grown flatter and the barriers between them lower. Companies have started to resemble chasms of interrelated corporate functions that involve, however, deformed structures. In those structures each new function is introduced in the form of a patch, and added to the structure - brikolage as Ciborra (1998) calls it. Business organizations have to decide where to collaborate and where to compete, as well as which parts of their business are fundamental – or *core*.

Turning now to the organization context, businesses – particularly in competitive, more market-driven environments – need to manage their resources efficiently and effectively. This is particularly true for information resources. 'Information Resources Management' (IRM), i.e., the design, implementation, management and control of information resources (Reponen et al., 1995; Kangas, 1997), becomes a vital means for business transactions in companies where products and communication become "informed" (Zuboff, 1988). Operators in the international market often perform occasional one-time transactions through electronic devices with their business partners. In today's digital economy, extensions of the traditional intra-firm value chain (Porter, 1985) concept are emerging. These value chains could be described as customer-centered "wheels of fortune" chains that happen more by coincidence than by plan or design. This means that there is a need to build a one-time value chain for almost every transaction. This chain is ephemeral and dissolves once the transaction has been conducted.

The traditional value chain and industry cluster analysis (Porter, 1985) as well as most other recent firm theory approaches appear to be obsolete in the new information economy. Also the discussion about centralization and decentralization seems to be purely academic, and has no practical value in the new economy.

The convention at the beginning of the 1990s was the alignment of information systems to the overall business strategy. However, in a networked organizational structure, a streamlined alignment would seem a difficult task. Moreover, too much streamlining and standardizing tends to lead to the loss of innovation, and to predictable management concepts. Predictability is seldom a good source of competitive advantage, because predictable – even though successful – firm

behavior can easily be imitated, allowing other firms to obtain the same competitive edge.

It is nonetheless important to understand how firms create and sustain competitive advantage in today's digital economy. New methods of competitive analysis and competence building must be found. Promising approaches in this regard include:

- 3) The resource-based theory of the firm and its implications for strategic management;
- 4) The relationship between organizational learning and competitive advantage; and
- 5) The role of information technology in these endeavors.

This study is trying to explore whether these approaches can also be applied to areas of mobile business and e-commerce and more commonly to the digital economy.

## SOME NOTIONS FROM THE MICRO-ECONOMIC THEORY

It can be claimed that any theoretical discussion concerning strategy is based on some theory of the firm. There are several economic theories of the firm guiding strategy research. Common to all those theories is that they try to address two basic questions: "why firms exist", and "what determines their scale and scope". (Cf. E.g., Holmstrom & Tirole, 1989) A third question, though less related to economic theory, is also posed: "What is the function of the firm and its managers?" (Seth and Thomas, 1994) It is therefore essential to review some basic assumptions behind the economic theories of the firm.

Two broad outlines of strategic theory development have proved to be useful. The first is strategy formulation research stemming from economics. The second is strategy implementation research, which has its roots more organization theory, sociology and psychology. (Cf. Seth and Thomas, 1994) Of course, strict economic theory and management theory have different research traditions, but it is sometimes worthwhile to combine them. Barney (1996) suggests this. He says that: "Many books and articles seem to adopt the fiction that it is possible to study strategy formulation and strategy implementation independently. This is obviously incorrect. It would be clearly be a mistake for firms to formulate their strategies without considering how they were going to implement those strategies." (p. x)

The classic Ricardian economics assumed land to be the most important factor of value. However, in the digital economy land has

not any more so significant value, neither have most other forms of tangible capital. They have been replaced by dynamic knowledge to be the most valuable factor.

## THE MAIN THEORIES OF THE FIRM OF THE 20TH CENTURY

The main theories of the firm of the 20<sup>th</sup> century can be listed to include (cf. e.g., Seth & Thomas, 1994; Conner, 1991; Kangas, 2000): the neoclassical theory, the Bain type competition model, the new industrial economics, the behavioral theory of the firm, the agency theory, the industrial organization approach – positioning, transaction cost theory, and the resource-based view of the firm.

Details concerning all the theories listed above, as well as their feasibility to strategic management can be found in the works of e.g., Seth & Thomas, 1994; Conner, 1991; Kangas, 2000; Ghoshal et al., 1999.

### Conclusions from the Discussion on Theories of the Firm

As a summary of a review of the modern economic theories of the firm a following conclusion can be drawn. All of the theories, except one, are rather static. They treat the economic world as rather static, and as a zero-sum game, where all the cards have already been dealt.

Competition in that kind of environment is somewhat superficial. Most firms are striving to gain competitive advantage over others. However, there seems to be a dilemma in the static theories; if all firms enjoy competitive advantage over others, then how can any firm enjoy it?

The only exception is the resource-based theory, which is dynamic and thus allows firms to carry on growing forever. By implication, the economy can carry on growing as well. As Ghoshal et al. (1999, 10) put it: It is time to expose the old, disabling assumptions and replace them with a different, a more realistic set that calls on managers act out a positive role that can release the vast potential still trapped in the old model; The new role for management breaks from the narrow economic assumptions of the past to recognize that; Modern societies are not market economies; they are organizational economies in which companies are the chief actors in creating value and advancing economic progress; The growth of firms and, therefore economics, is primarily dependent on the quality of their management; The foundation of a firm's activity is a new "moral contract" with employees and society, replacing paternalistic exploitation and value appropriation with employability and value creation. The strategy-structure-system trilogy was a revolutionary discovery in the 1920s. It was a wonderful way to describe big companies and gave a good mental toolkit to govern and coordinate immense conglomerates. However, times changed, companies that had a clear strategy and structure became more systematic and their action predictable, and machine-like systems of control are not helpful, of course. (Ghoshal et al., 1999)

The shift to a new paradigm in the digital economy can only happen through organizational learning, which is enabled only through a dynamic view of the firm and entrepreneurship. From the ones described above, the only theory of the firm to make this possible is the resource-based theory. Therefore, the resource-based management and its concomitants, competence- and capabilities-based management, should be studied more thoroughly in connection with strategy formulations.

## RESOURCES AND COMPETITIVE ADVANTAGE

Barney (1991a) claims that whenever identical firms populate an industry, any one firm cannot enjoy sustained competitive advantage. This is also true even if a firm is a 'first mover' (e.g., Lieberman & Montgomery, 1988). It cannot have sustained competitive advantage unless the firms in its industry are heterogeneous in terms of the

resources they control. On the other hand, even when the firms in an industry are perfectly homogenous, such firms may collectively be able to obtain sustained competitive advantage over firms in other industries as long as there are strong entry or mobility barriers. Where such barriers do exist, this sustained advantage will be reflected in above normal economic performance for these firms (Porter, 1980). Barney (1991a) assumes that barriers to entry and mobility only exist when competing firms are heterogeneous in terms of the strategically relevant resources they control. The resource-based view thus takes the value chain logic (Porter, 1985) a step further by examining the attributes that resources identified by value chain analysis must possess in order to be sources of sustained competitive advantage.

Barney (1991a) discusses four indicators of a firm's resources that generate sustained competitive advantage:

**Value:** Can the firm's resources respond to environmental opportunities and/or threats? Firm's resources can only be a source of sustained competitive advantage when they are valuable, meaning that they enable a firm to conceive of or implement strategies that improve its efficiency and effectiveness.

**Rareness:** How many competing firms already possess these valuable resources? Some strategies require a particular mix of physical capital, human capital, and organizational capital (immaterial) resources in order to be implemented.

**Imitability:** Are these resources costly to imitate? Imitation can be done through duplication or substitution (e.g., through strategic alliances). Costliness depends on any or a combination of the following issues: (i) whether there is a complex history as to the creation of a given resource; (ii) whether a resource involves numerous 'small decisions' in its creation; and (iii) whether the resources are very complex socially, e.g., involving many stakeholders.

**Supportive Organizational Arrangements:** Do organizational arrangements support and exploit resources? Within this context, the emphasis is on managerial and organizational resources. Organizational resources include close interpersonal relationships among managers, which in turn enhance mutual trust, reduce monitoring cost and enhance the search for new opportunities.

Barney, in analyzing sources of competitive advantage (1991a), makes two further assumptions that contradict traditional accounts (e.g., industry cluster analysis by Porter, 1985) as to how a firm's resource homogeneity and mobility create such advantage:

- (i) Firms within an industry (or group) may be heterogeneous with respect to the strategic resources they control;
- (ii) These resources may not be totally mobile across firms, and thus heterogeneity can be long lasting.

The implications of these two assumptions are examined in the context of Barney's VRIO framework - Value, Rareness, Imitability, and Organization - as depicted in Figure 1.

Figure 1: The VRIO framework for evaluating the competitive positioning of a firm's resources and capabilities. Adapted from Barney (1994)

| Valuable? | Rare? | Costly to Imitate? | to Efficiently Organized? | Competitive Implications        |
|-----------|-------|--------------------|---------------------------|---------------------------------|
| no        | --    | --                 | No                        | competitive disadvantage        |
| yes       | No    | --                 | ↑                         | competitive parity              |
| yes       | Yes   | no                 | ↓                         | temporary competitive           |
| yes       | Yes   | yes                | Yes                       | sustained competitive advantage |

The next section articulates the role of information technology in support of organizational competencies and capabilities.

## COMPETENCIES, CAPABILITIES AND INFORMATION TECHNOLOGY

Organizational *competencies* refer to the unique knowledge owned by the firm. Firms are presumed to focus on a few key or core competencies, which they can exploit effectively to their competitive advantage. For Rumelt (1994), the concept of core competencies relates directly to the resource-based framework. As such, the competitive advantage of a firm is determined not only by the industry or environment but also by its possession of unique skills, knowledge and resources (competencies). This can be seen as complementary to market structure analysis, as captured by the seminal competitive forces model by Porter (1990).

In the work of Rumelt (1994), 'corporate core competence'—the concept developed by Prahalad and Hamel (1990)—is taken to include:

1. **Corporate span.** Core competencies span [several] business [functions] and products within a corporation. Put differently, powerful core competencies [can] support several products and businesses.
2. **Temporal dominance.** Products are but momentary expression of a corporation's core competencies. Competencies are more stable and evolve more slowly than do products.
3. **Learning-by-doing.** Competencies are gained and enhanced by work. Prahalad and Hamel (1990, p. 82) say that 'core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technologies. ... Core competence does not diminish with use ... competencies are enhanced as they are applied and shared'.
4. **Competitive locus.** Product-market competition is merely a superficial expression of a deeper competition over competencies. (Rumelt, 1994, p. xv-xvi)

Organizational *capabilities* refer to the firm's ability to use its competencies. They represent the collective tacit knowledge of the firm in responding to its environment. Capabilities are developed by combining and using resources with the aid of organizational routines, i.e., those specific ways of doing what the organization has developed and learned. Capability development therefore involves organizational learning. This learning takes place within the context of the firm and is thus path-dependent and firm specific; as a consequence, it is impossible to imitate and may thus create competitive advantage. Core capabilities are thus those that differentiate a company strategically in term of beneficial behaviors that will not be observed in its competitors. Such capabilities evolve from the competitive environment and business mission of the firm through a 'capability learning loop' (Andreu & Ciborra, 1996). As these authors put it: "*Core capabilities clarify their role and scope through acquiring a sense of why they are important*" (Andreu & Ciborra, 1996, p. 112). From the above reasoning, one can conclude that core capabilities are important - or, in Barney's terms, 'valuable' They are firm specific, thus heterogeneously distributed across competing firms, and are path-dependent and thus imperfectly mobile. The consequence of this is that core capabilities are sources of sustained competitive advantage (Andreu & Ciborra, 1996).

Sanchez, Heene & Thomas (1996) posit that as the combining of "internal" and "external" environments is of a systemic nature, it is hard to identify strict borders between the "in" and "out" in the analysis of a specific case. In a similar analysis, Sanchez, Heene & Thomas (1996) say that firms can be distinguished by (i) distinctive strategic goals, (ii) strategic logic, (iii) resources available, and (iv) the coordination of resources' deployment. A firm's management processes provide the mechanisms for coordinating and directing its resources under the governance of strategic logic. A firm achieves competence when it is able to sustain coordinated deployment of resources in ways that help it to pursue its goals. This pursuit takes place through the following dual activities, although these do not have to be complementary in all cases:

**Competence leveraging:** coordinated deployment of resources that do not require qualitative changes in the resources or in the mode of their coordination

**Competence building:** acquisition or use of qualitatively different resources or modes of coordination

It thus follows that competence-based competition is based on:

- (i) Dynamic single loop learning (See e.g., Argyris & Schön, 1978) processes of coordinating and leveraging organizational processes (e.g., current or new market opportunities) into competencies without qualitative changes in existing stock of assets and capabilities (changing only the way of acting, not the underlying assumptions).
- (ii) Dynamic double-loop learning (See e.g., Argyris & Schön, 1978) processes of coordinating and building competencies, with qualitative changes in existing stocks of assets and capabilities (changing the way of acting, as well as the underlying assumptions). In this framework "strategic change within a firm is motivated by managers' perceptions of strategic gaps between their firm's current stocks and flows of assets and capabilities ... and the stocks and flows they believe will be needed to achieve the firms goal's in its competitive environment" (Sanchez, Heene & Thomas, 1996).

The link just set out between competencies, capabilities and single and double loop learning highlights the important role that information technology (IT) and telecommunications (TC) could play in the coordination and learning support (automation) of organizational processes and, by implication, competitive advantage.

The issues involved here are by no means straightforward. Barney (1991), for instance, questions the claim that information systems are a source of sustained competitive advantage. For him, this very much depends on the type of system involved. He contends that machines—be they computers or otherwise—are part of the physical technology of a firm, and usually can be bought across markets. As such, any strategy that exploits just the machines (computers) in themselves is likely to be imitable and thus not a source of sustained competitive advantage.

Mata et al. (1995), in their resource-based analysis, found that out of four attributes of IT—capital requirements, proprietary technology, technical IT skills, and managerial IT skills—managerial IT skills is the only resource that can bring sustained competitive advantage. Keen (1991) comes to similar conclusions, stating that while IT may be a commodity, *IT management* is not—it is the value-added element that *leads to* competitive advantage. Mata et al. (1995) point out, of course, that we cannot consider the other three attributes unimportant, since they may still produce, admittedly temporary, competitive advantage. Mata et al.'s analysis suggests that IT managers should work closely with other managers within the firm to support their information needs. It must be recognized that the information needs of various stakeholders vary in different types of firms depending on the firm's industry, resources and structure.

Mata et al.'s findings suggest two factors that can contribute effectively to gaining sustained competitive advantage:

- (1) Developing methods for strategy generation involving information resources management that emphasize and enforce the learning of these skills across the whole organization.
- (2) Developing shared goals within the whole organization.

Andreu & Ciborra (1996) have also come to similar conclusions in their resource-based discussion, combining IT, organizational learning, and core capabilities development. These authors view IT as a central support for routinization and capability learning loops. Moreover, IT is also seen as instrumental in making capabilities become core. Andreu & Ciborra (1996, pp. 124-125) also suggest four guidelines if IT is to play a key role in making core competencies and capabilities really count for a firm:

- *Look out for IT applications that help to make capabilities rare.* An example of this could be the American Airlines computerized reservation system (e.g., see: Copeland & McKenney, 1988), which, at least at the beginning, was unique and thus rare.
- *Concentrate on IT applications that make capabilities valuable.* Rosenbluth travel agency could be an example of this (e.g., see: Clemons & Row, 1991).

- *Identify capabilities that are difficult to imitate.* This also points to the American Airlines case (Copeland & McKenney, 1988) where systems were complex and thus difficult to imitate.
- *Concentrate on IT applications with no clear strategically equivalent substitutes.* Sometimes certain functionality can only be achieved by means of particular IT applications. Thus IT contributes to the lack of substitution. An example of this could be WWW-pages where the producer has included certain features that can only be viewed on specific browser versions.

Andreu & Ciborra (1996) go on to provide a list of issues where IT-based support for capability creation is feasible. This includes:

- Supporting the firm's capabilities learning process (capability learning loop).
- Supporting the sharing of capabilities.
- Facilitating reflection, experimentation and training on routines and capabilities.
- Supporting and enabling capability diffusion.
- Using IT applications that provide information about the competitive environment.
- Using IT applications that disseminate the business mission.

Conclusions from the discussion upon the theories of the firm, and their suitability for strategic information resources management in the digital age

As a summary of this review of the modern economic theories of the firm a following conclusion can be drawn. All of the theories, except one, are rather static. They treat the economic world as rather static, and as a zero-sum game, where all the cards have already been dealt.

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