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# Business Process Agility

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## ABSTRACT

Business processes are the central building blocks of how individuals, organizations, and industries participate with one another. In a dynamic environment, a firm's ability to respond and adapt is dependent on the agility of its business processes. However, agility from a business process perspective has yet to be defined and measured. This paper refines the definition of operational agility from the IS literature and tests a conceptual model. A field study is used to evaluate a metric created for measuring business process agility and understanding the relationship between the firm's system capabilities and management's factors driving adoption of agile business processes.

## KEYWORDS

Business Process, Agility.

## INTRODUCTION

Practice discusses business process agility and the need for firm agility in today's changing business environment.<sup>1</sup> Yet both practice and academia continue to struggle in defining business process agility with the primary issue the meaning of "agility".<sup>2</sup> The definition of a business process is well known; it describes "how" work is done rather than "what" work is done (Davenport, 1993). More recently, Smith and Fingar (2003) refined the definition as "the complete and dynamically coordinated set of collaborative and transactional activities that deliver value to customers". However, agility definitions in the literature are less concrete and incorporate different dimensions dependent upon the type of agility discussed. The academic literature on agility builds from economics literature on flexibility, flexible manufacturing and agile manufacturing. In addition, IS literature recognizes the role of IT as a "platform for agility" and its ability to provide "strategic value" (Sambamurthy, Bharadwaj, and Grover 2003).

Although the literature has recognized that IT investments and capabilities enable a firm to develop agility, the literature has yet to examine the perspective of agility at the business process level. Business processes are central to how individuals, organizations, and industries participate with one another (Malone, Crowston, and Herman 2003). In addition, "research on understanding why some activities, routines, or business practices are able to generate competitive advantages while others cannot is likely to be more helpful than research that examines just the relationship between resources and firm performance at an aggregate level" (Ray, Barney, and Muhanna 2004). The purpose of this paper is to develop a definition of business process agility by refining the definition of operational agility (Sambamurthy et al 2003) from the IS literature, test a theoretically driven model, and develop a metric to measure and evaluate business process agility which is tested in a field study.

### Business Process Agility Defined

The IS literature has recently recognized agility as an important construct, and has theorized that it is a "higher order capability" comprised of customer, partnering, and operational agility (Sambamurthy et al 2003). Customer agility is the leveraging of customer relationships for innovative ideas leading to new products or services and creating new opportunities.

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<sup>1</sup> February 1, 2005 "Agile to the Bone" Intelligent Enterprise

<sup>2</sup> August 15, 2004 "The Struggle to Define Agility" CIO Magazine

Whereas, partnering agility is the leveraging of supplier relationships. Operational agility is “the ability of firms’ business processes to accomplish speed, accuracy, and cost economy in the exploitation of opportunities for innovation and competitive action” (Sambamurthy et al 2003).

Past literature has examined the ability of a firm to adapt at the business process level, often using the words flexibility and agility synonymously. Drawing from this literature, we distinguish a difference between flexibility and agility. At the firm level, the economics literature approaches flexibility from an operational and strategic perspective. Klein (1984) identifies firm flexibility dependent upon how the firm positions itself (risk or opportunities). This is further reflected at the production process level in which a firm can contend with “foreseeable events” or take advantage of opportunities (Carlsson 1989). Additionally, flexible manufacturing literature has continued upon the two major themes from economics posturing defensive or proactive positioning (Gerwin 1993). Upton (1994), however, best illustrates the flexible process as a “set of capabilities” focused on “what we can do” versus “what the customer sees”. Indeed internally “what can we do” can lead to external flexibility in “what the customer sees”.

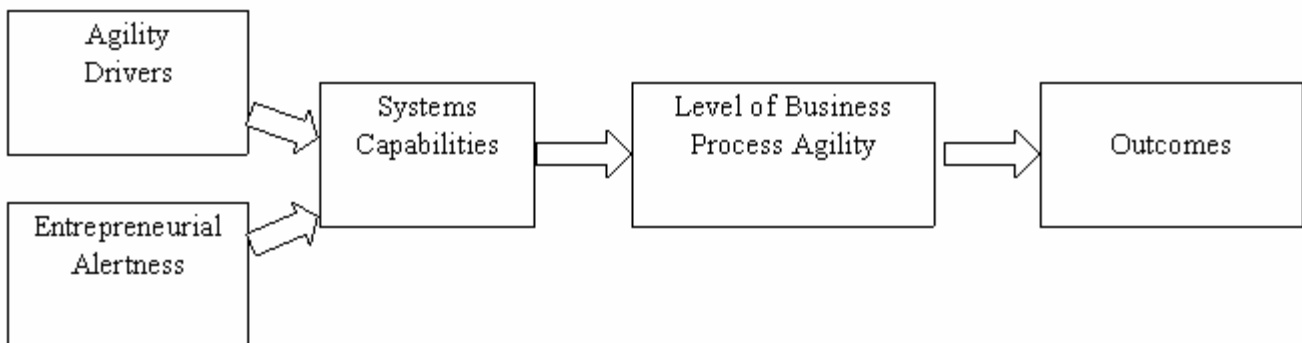
Where the emphasis on flexibility is the choice set or set of capabilities, agility emphasizes “reconfigurability” (Dove 1995). Agile manufacturing incorporates the characteristic of flexibility, but “highlights the reconfigurable aspect” (Gould 1997). Therefore a firm may have flexibility, but lack agility. To be agile, the firm must have the ability to redesign and reconfigure individual business process components, combining individual tasks and capabilities in response to the environment.

Therefore, we refine the definition of operational agility within the context of a business process to define business process agility as:

*“the ability to dynamically modify and/or reconfigure a business process selecting from a set of business process capabilities to accommodate required and potential needs of the firm.”*

**CONCEPTUAL MODEL**

IT capabilities are deemed as enablers to firm performance and the alignment between IT capabilities and strategy is increasingly important (Hevner, March, Park, and Ram 2004). In fact, performance effects not only are affected by responding to environmental change, but also may be contingent upon the congruency between design choices and strategy (David, Hwang, Pei, and Reneau 2002). The results of these choices can enable or hinder performance (David et al 2002). Understanding key factors that drive adoption decisions of agile business processes (design choices) combined with IT capabilities will help management understand the value of their process investment. However, it is important for management to be alert and responsive to those environmental factors and understand how their resources can be reconfigured to take advantage of opportunities. Therefore, the conceptual model also considers an organization’s entrepreneurial alertness. Figure 1 depicts the conceptual model, which is discussed in the following sections.



**Figure 1:** Conceptual Model (adapted from Sambamurthy et al. (2003))

**Agility Drivers**

Contingency theory states that there is “no best way to organize” (Galbraith, 1973) and suggests that the organizational structure should match with variables that are both internal and external (Tushman and Nadler 1978). These contingent variables include technology, environment, and the nature of interdependencies within the firm. Furthermore, firms may

choose to adopt and invest in various levels of business process agility. However, the level of adoption is driven by internal (within a firm's control) or external influences. "Agility drivers" are changes and/or pressures from the environment that require a firm to seek new ways of managing the business to maintain competitive advantage (Sharifi and Zhang 2001). "Agility drivers" found in multiple studies include: technology based, customer requirements, market/competitor driven, and regulatory based.

### **Entrepreneurial Alertness**

Environmental forces alone do not drive investment in system capabilities; a firm must be alert and responsive to the environmental cues. Entrepreneurial Alertness is a catalyst to business process agility. Entrepreneurial alertness is a firm capability in which the firm has strategic foresight and systematic insight capabilities (Sambamurthy et al 2003). Strategic foresight is the capability to anticipate disruptions, threats, and opportunities in the environment whereas strategic insight is the capability to visualize and assess the threats and opportunities within the context of the firm's resources and capabilities. Entrepreneurial alertness allows for a firm to take strategic actions. Entrepreneurial actions allow the firm to exploit opportunities through responsiveness and alertness (Zaheer and Zaheer 1997). Responsiveness involves the speed at which the firm responds to changing environmental signals, while alertness involves the firms range and pattern of use of its information network (Zaheer and Zaheer 1997). Therefore, an alert and responsive firm is likely to have higher strategic foresight and systematic insight capabilities compared to a less alert and responsive firm.

### **System Capabilities**

Business processes require resources, and research has recognized that more resources are required to enable agile processes. Therefore, to examine agility at the business process level of analysis, the link between system capabilities and resources must be understood. Drawing from the resource-based view theory (Barney, 1991), sustained competitive advantage is gained from the exploitation of valuable, and rare resources and capabilities that are hard and costly to imitate. Strategic management distinguishes between resources and capabilities where resources alone may be easily copied; however, capabilities reflect how a firm combines its resources (Amit and Schoemaker, 1993). Likewise, a firm must have the ability to organize its business processes in an efficient and effective manner to realize the full potential of its resources and capabilities (Ray et al 2004). Requirements for agility are primarily based upon three main concepts comprised of connectivity, compatibility and modularity (Duncan 1995) that are built from the foundation of a firm's "reach" and "range" infrastructure (Keen 1991). *Reach* involves the connectivity capability of a firm, whereas *Range* involves how well activities are seamlessly shared.

The constructs of connectivity, compatibility, and modularity identify dimensions of flexibility of a firm's IT infrastructure. Connectivity is "the ability of any technology component to attach to any of the other components inside and outside the organizational environment" while compatibility is the "ability to share any type of information across any technology component" (Byrd and Turner 2000). From a resource perspective, the IT infrastructure requires adequate connectivity and compatibility to maximize a firm's reach and range. The third construct, modularity, allows for change within the underlying structure of a firm's reach and range. Modularity is "the ability to add, modify and remove any software, hardware or data components of the infrastructure with ease and with no major overall effect" (Byrd and Turner 2000).

### **Outcomes**

An IT infrastructure that enables a level of business process agility which fits best within a firm's organizational framework and strategic positioning provides a firm with a source for business outcomes. "IT creates value for the organization by improving individual business processes, or interprocess linkages, or both....the greater the impact of IT on individual business processes and on interprocess linkages, the greater will be the contribution of IT to firm performance" (Tallon, Karemer, and Gurbaxani 2000). One such measure to business outcomes is in the form of digital options (Sambamurthy et al 2003) which are derived from financial theory of real options (Amram and Kulatilaka 1999). From an IT perspective, firms can position themselves with their IT investments and "exercise their option" to exploit an opportunity (Sambamurthy et al 2003; Amram and Kulatilaka 1999).

## **DISCUSSION**

The purpose of this project is to extend previous research by Sambamurthy et al (2003) by focusing on business process agility and the value derived from the adoption and implementation of dynamic process reconfigurations (level of business process agility). Next steps include a field study to identify variations in processes, and to understand the major drivers of

agile process adoption. A field study is a preferred method when “how” and “why” questions are posed (Yin 2003). Many of the constructs in the hypothesized model have been incorporated into prior literature; we will adapt our metric from these works for this study (See Table 1).

| Conceptual model Construct | Source   |
|----------------------------|--|
| Agility Drivers            | Sherifi, H. and Zhang, Z. (2001) “Agile manufacturing in practice: Application of a methodology” <i>International Journal of Operations &amp; Production Management</i> (21:5/6), p. 772.  |
| Entrepreneurial Alertness  | Brown, T., Davidsson, P. and Wiklund, J. (2001). “An Operationalization of Stevenson’s Conceptualization of Entrepreneurship as Opportunity-Based Firm Behavior” <i>Strategic Management Journal</i> (22). Pp.953-968.             |
| System Capabilities        | Byrd, T. A. and Turner, D. E. (2000) “Measuring the Flexibility of Information Technology Infrastructure: Exploratory Analysis of a Construct” <i>Journal of Management Information Systems</i> (17:1), pp. 167-208.               |
| Outcomes                   | Tallon, P.P., Kereker, K.L., and Gurbaxani, V. (2000) “Executives’ Perceptions of the Business Value of Information Technology: A Process-Oriented Approach” <i>Journal of Management Information Systems</i> (16:4), pp. 145-173. |

**Table 1:** Model Constructs

To date, no metric of business process level agility has been developed and one of the contributions of this study is to develop such a metric. We have identified the procurement and sales processes as potential units of analysis. Both processes have undergone significant reengineering efforts when business-to-business capabilities are incorporated. Figure 2 shows the potential model for the order fulfillment process. It shows the major steps in the process, along with sets of capabilities that may be used to execute each step. During the field study, we will interview both managers and IT personnel to determine which capabilities have been developed, and how the process can be dynamically reconfigured during operations (illustrating our findings by only including the capabilities that the firm has, and drawing arcs between capabilities that can be configured together). We expect to identify a range of agility levels, illustrated through agility webs within the process models. The model developed from this research will provide a framework that will be used in future empirical studies for generalization purposes. We expect the study will lead to better understanding of business process agility, and will serve as foundational work that guides several additional studies.

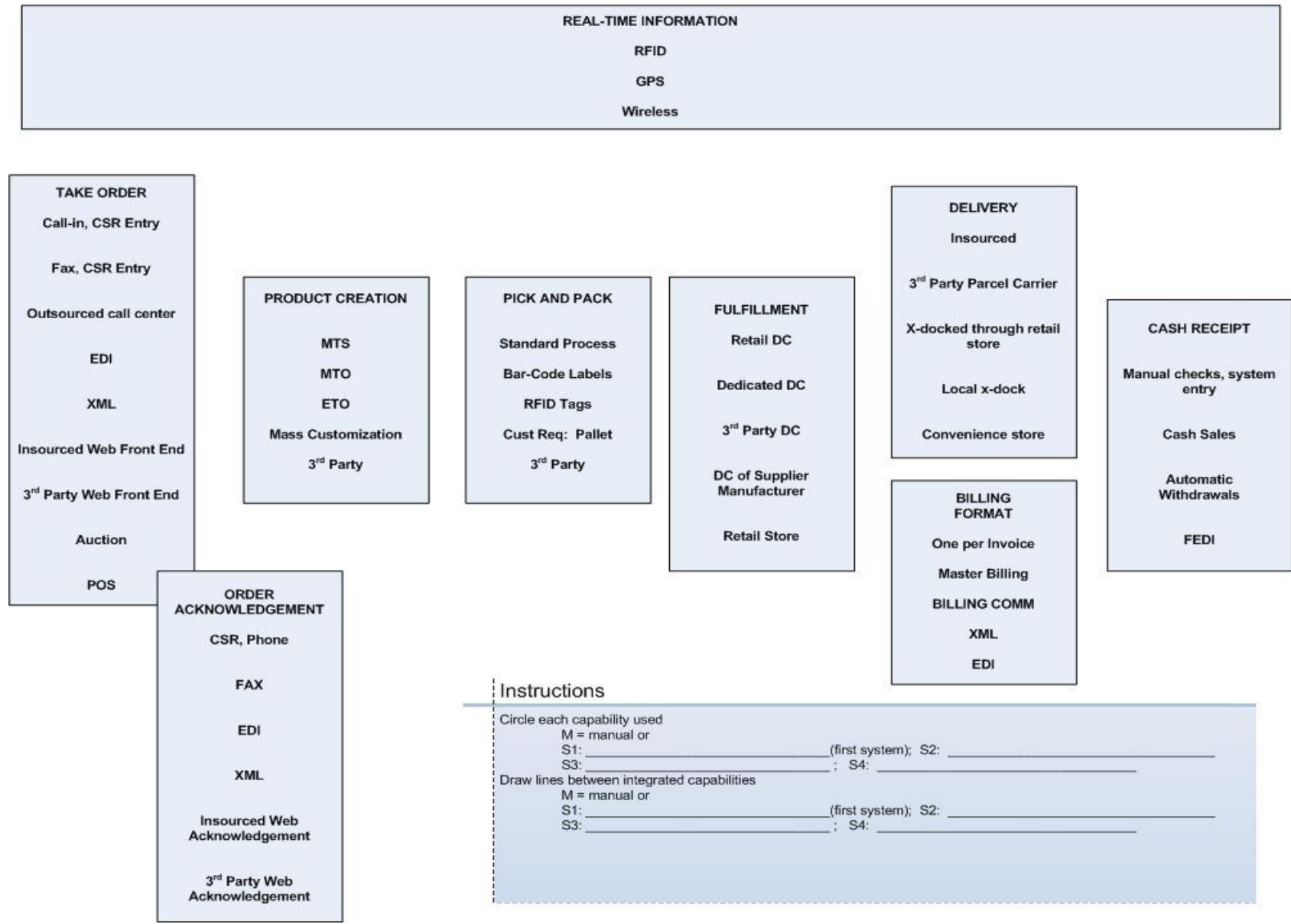


Figure 2: Model Example

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