1995

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Fast cycle time and the role of information technology: A framework for analysis

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ABSTRACT
Achieving fast cycle time is increasingly becoming an overriding objective for organizations wanting to succeed in the global business environment. In such an increasingly competitive and global environment of declining margins, information technology is both driving and enabling business. The focus of these organizations is the adoption of a fast cycle time (FCT) strategy that achieves increased customer satisfaction and/or cost reduction.

This paper examines the organizational processes in the context of interdependence, and identifies areas where information technology can play a pivotal role in bringing about an effective and responsive transformation. It also, with the help of a framework, addresses the issue of cycle time reduction and information technology leverage and provides a methodology for implementing a fast cycle time strategy successfully in organizations.

INTRODUCTION
Customers' expectations are changing. They want a larger variety of products with both continually improving quality and shorter delivery times (Northey, 1991). As a result of this shift in emphasis and perspective among customers, organizations are having to look closely at their own processes and systems in order to react to the new and dynamic marketplace. In this mood of increasing self-introspection, time is becoming an important area of focus. Whether it is materials, manufacturing, design, or customer service, almost every discipline has responsibilities which include some continuous reduction in time and cost of work processes (Brown, 1994). Another related development is the advancement in information technology. With increasingly sophisticated technology, organizations are discovering new ways and methods in areas such as manufacturing and distribution (Smith & Reinertsen, 1992). Product life cycles have shortened and continue to shrink. New information technologies have yielded astounding increases in quality, productivity, and customer satisfaction (Knorr & Thiede, 1991). To use these technologies effectively, organizations need an integrated approach to strategic, tactical, and operational planning.
The need for an integrated blueprint to achieve the twin objectives of cost reduction and increased customer satisfaction is being stressed by many forward-looking organizations (Wetherbe, 1995). Driving this future plan is the underlying concepts of business reengineering as a "fundamental rethinking and radical redesign of business processes to remove dramatic improvements" (Hammer & Champy, 1993, p. 32). While it is clear that information technology (IT) can have a significant impact on reengineering efforts and fast cycle time, it is also clear that we need to identify and differentiate the use of IT in different areas. For example, Venkatraman (1991) proposes a framework for classifying reengineering efforts based on the role of IT. Thus, it is imperative that an IT framework in the light of the fast cycle time (FCT) strategy be developed in order to assist practicing managers in planning for and achieving fast cycle time.

This paper addresses specific issues related to FCT strategy and the role of IT in facilitating fast cycle time. The rest of the paper is laid out as follows. The next section defines FCT and places some of its essential concepts in the right perspective to aid in future discussion and analysis. The core elements and benefits of FCT are delineated in the next section. The evolving role of information technology strategy, its relevance, and the points of leverage are addressed in the next section. A framework to analyze the role of IT strategy in facilitating FCT is presented in the next section. To illustrate the useful deployment of IT to achieve FCT, the next section enumerates some of the best-in-class FCT practices that organizations should adopt in order to achieve successful FCT. The conclusion section of the paper offers specific suggestions for organizations pursuing the FCT goal.

FAST CYCLE TIME (FCT) CONCEPTS

Fast cycle time is the ongoing ability to identify, satisfy, and be paid for meeting customer needs faster than anyone else (Meyer, 1993). Implied in this definition of FCT is the criticality of continuous improvement in business processes, functions, and objectives. To achieve a greater control over one's business, organizations are changing the way they conduct their business transactions with other firms (Premkumar, Ramamurthy, & Nilankanta, 1994). And, bringing about this transformation is the catalytic role of information technology (Bakos & Brynjolfsson, 1983). In recent years, the use of interorganization information systems such as electronic data interchange (EDI) to link business partners indicates the increasing awareness of the time dimension in business (Blackburn, 1991; Ferguson & Hill, 1988; Johnston & Vitale). A recent survey of top IS executives reflects the importance of this underlying trend of linking businesses in order to reduce time and increase customer satisfaction (Niederman, Brancheau, & Wetherbe, 1991).

FCT is the ultimate close-to-customer strategy (Meyer, 1990). In the age of new business realities and imperatives, the importance of customer as a mechanism who defines, describes, and demands customer service levels and satisfaction cannot be overemphasized. The dynamic, ongoing nature of this customer demand is what drives FCT (Thomas, 1990). A corollary of this perspective is that competitors who continuously improve their cycle times will pass those who
pause to relax. Following this critical aspect of FCT is the need to train employees and empower them to achieve FCT in all of their operations and functions. Training employees to analyze work flows and processes to eliminate non-value-added work should be the cornerstone of the organization’s policy (Rothfeder, Bartimo, Therrien & Brandt, 1990; Main, 1990). Effective training will enable employees to identify FCT opportunities in the various business cycles. Organizations march to the pace of the company clock, whereas the marketplace marches to the market clock (Smith & Reinertsen, 1992). The main objective of FCT practitioners is to eliminate any delay between these clocks and ensure synchronicity at all times.

In the realm of FCT, reducing cost and time has a condition attached to it. Customer satisfaction is that all-important condition that FCT needs to fulfill every time cost/time reduction is attempted. Contrary to earlier opinions, speed can create a focus that actually improves quality and reduces cost (Nomaka, 1990). Ensuring customer satisfaction also drives payment to its logical end. And, less outstanding receivables means more cash in hand to invest in future products and services. More importantly, prompt payments reflect the superior value of the product/service that the organization has to offer (Meyer, 1993).

The last, but not the least, important aspect of FCT is the requirement to stay well ahead of the competition. In the emerging global marketplace, the ability to emulate quality and approach is an ever-increasing danger that organizations need to watch out. Sustaining competitive advantage is a role that IT is getting better at (Davenport, 1993). However, before IT can be effectively used to leverage a business’s core competencies, the concept of FCT has to be stripped down into greater detail in order to understand its core elements and the potential benefits.

**CORE ELEMENTS AND BENEFITS OF FCT**

The core principles that drive FCT may at the surface seem intuitive and simple, but they serve as central pillars on which the FCT goal rests. In fact, Meyer (1990) states that these elements constitute the core of the FCT strategy. FCT devoid of these core elements will not provide the necessary leverage for organizations to benefit.

**Core Element #1: Value Addition Through Customer Focus**—The business of business is to provide customers the maximum value for the price (Meyer, 1993). Hence, it follows that organizations with such a philosophy would base their strategy and structure on the processes that delivered value to their customers. This focus on value delivery to customer is a core element that initiates and sustains FCT in organizations. Within this core element, the focus on the external customer is an important one. Everyone, including stockholders, benefit when a company defines its strategy, structure, and functions based on value-addition to customers. Providing the most value within the shortest time is what FCT is all about.
Core Element #2: Continuous Improvement of Value Processes—Every output or a result a business achieves is the result of the requisite inputs and the process itself. When the identified inputs do not provide the required outputs a mismatch is said to have occurred; focusing the attention on the mismatch itself does not provide much insight into what caused the mismatch (Meyer, 1993). FCT competitors should view this mismatch as symptoms of process errors and not the error itself. This important, but subtle distinction is an important turning point in an organization's perception. Traditional organizations, when first undertaking process analysis, often mistakenly make it an end in itself rather than a means for cycle time reduction (Stalk, 1988). Implied in this core element is the need for FCT organizations, in addition to focusing in on the problem itself, to limit the scope and complexity of each process analysis and increase the frequency.

Core Element #3: Interdependence of Business and Organizations—FCT competitors focus their attention on understanding how their markets, strategy, and organization operate as a system of interdependent structures rather than as a collection of independent elements (Blackburn, 1991). Increasing organizational interdependencies is fast becoming manifest in the form of relationships with suppliers and competitors (Owen, 1986). In this interorganizational perspective of business, the fast cycle time development is always limited by the slowest element in the development process (Nichols, Frolick, & Wetherbe, 1995).

Core Element #4: Criticality of Organizational Learning—Organizational learning is at the heart of sustained competitive advantage in the fast cycle time environment (Senge, 1990). It follows that a sustainable FCT capability can be achieved only by learning faster; not by working faster (Meyer, 1993). This increased emphasis on organizational learning is the core of the FCT concept and strategy. The idea of learning drives the theory of FCT and turns it into a powerful tool for organizations.

Thus, the whole concept of FCT is grounded in the above core elements. On the surface of it, these core elements seem rather intuitive; but, what makes these simple concepts so effective is the leverage that is obtained when used in conjunction with IT. Depending on the number of core elements present in an organization's strategy, and the extent of use of IT, both internal and external benefits accrue to organizations. Another important consideration is the incorporation of this FCT culture and "way of thinking" in the organization; the consequence of this is that products/services reflect the FCT value to the customers. It is this cyclical process that differentiates FCT from other linear management processes such as total quality management (TQM) and business process engineering (BPR).

BENEFITS OF FCT

The advantages that accrue to a FCT organization are manifold. These advantages manifest either internally, in terms of process efficiency, cost reduction, etc. or externally, in terms of increased market share, higher profits, etc. These benefits accrue to the FCT organization over
a period of time and effort; hence, organizations planning or practicing FCT should not expect immediate results. Both the internal and external benefits of FCT tend to offer the effect of synergy in an organization. A few of the benefits of FCT help illustrate this.

**EXTERNAL BENEFITS**

*Raises Entry Barriers.* The practice of FCT principles is only seen in the form of a timely, superior product/service, but cannot be deciphered to reveal the means to get there. This has the effect of raising the barrier of entry for present and potential competitors.

*Yields Higher Profits/Margins.* FCT not only beats the competition, but it also effectively eliminates the competition. Reduced time and cost results in direct savings in terms of pricing of the product/service. These price advantages can then be transferred to the customer. Policies such as these not only win new customers, but more importantly help retain existing ones. This aspect translates into higher profits/margins in the business.

*Increases Market Share.* By being first, the FCT competitor gets earlier feedback from customers than its competitors (Meyer, 1993). This enables the company to stay ahead of the competition and increase its market share through product/service innovation.

*Increases Customer Responsiveness.* Because of reduced delay between customer need and its fulfillment, customers feel attended to and satisfied. This increased customer satisfaction results in customer loyalty, customer-based expansion, and reduced inventory. FCT, by reducing costs and focusing on value addition from the customer's perspective eliminates unnecessary process and time waste in its operations.

**INTERNAL BENEFITS**

*Reduced Time-to-Detect and Correct Problems.* The process orientation of FCT illuminates root causes of problem and therefore enables management to tackle them earlier. This direct approach results in reduced time-to-detect and subsequently, correct the problem.

*Complete Learning Loops.* Improving functionality and reducing time to complete a process requires a migration from linear to cyclical thinking (Wetherbe, 1995). Organizations going through the various stages of definition, development, and introduction of a product/service are said to have been in a learning loop (Meyer, 1993). The more learning loops one completes, the greater the potential for learning (Senge, 1990). The practice of FCT principles leads to more complete opportunities.

*Empowers People and Builds Trust.* Empowering people is seen as the effect of FCT rather than the means. FCT eliminates the philosophical debate and focuses empowerment on making processes move faster to achieve results quicker (Eisenhardt, 1990).
The list of benefits is by no means exhaustive. Additional internal benefits include easy measurement, reduced overhead, drives information flow across and within organizations, increases a sense of accomplishment, and increases quality of product/service. Other external benefits include inclusion of latest IT, enables more accurate market forecasts, and locks up distribution channels.

**ROLE OF INFORMATION TECHNOLOGY STRATEGY**

During the past thirty years the overall business environment and the IT embedded within it have undergone tremendous changes (Huber, 1984). Thanks to the galloping pace of developments in related areas, IT has grown by orders of magnitude in both computing speed and capacity (Athey & Zmud, 1988). New and emerging technologies promise to improve communications, computing speed, and user interface. The impact of these technologies is bound to be felt by an increasing number of organizations (Straub & Wetherbe, 1989). Investments in computers and telecommunications now amount to about half of most large firms' annual capital expenditure (Franke, 1987). Developments in IT have undoubtedly changed the way business competes. Companies are required to operate in a new set of environment and the realities that surround them.

**BUSINESS REALITIES OF THE 1990s**

IT is no longer limited to accounting operations; it affects business at its very heart (Keen, 1991). Thinking on information technology derived competitive advantage has been strongly influenced by conceptual frameworks (Porter & Millar, 1985; Rackoff, Wiseman & Ulrich, 1985; Wiseman & MacMillan, 1984). In addition, many researchers have used case studies to illustrate the strategic effect of IT. For example, Merrill Lynch's CMA and McKesson's Economost (Clemons & Row, 1988) are exemplary. Also, American Airlines SABRE system (Copeland & McKinney, 1988; Doll, 1989) and American Hospital's ASAP system are equally well known in academic and business circles.

Driving these strategic and other uses of IT in information systems is an underlying IT strategy. The importance of having a well articulated IT strategy is especially highlighted. Organizations are required to have an appropriate IT strategy and structure in place before principles of FCT can be realistically and effectively employed (Wetherbe, 1995).

**IT STRATEGY AND POINTS OF LEVERAGE**

The development of technological resources and expertise can distinguish an innovating organization (Kettinger, Grover, Guha, & Segars, 1994). The uniqueness of IT use and development in an organization can give it a distinct advantage (McFarlan, 1984). Sustaining this
unique competitive advantage may be achieved by leveraging unique firm attributes with IT to realize long-term performance gains. Based on our understanding of the literature, we can identify five major points of leverage in an organization to implement FCT successfully. The leverage points include General Management, Human Resources Management, Product/Service Management, Operations Management, and Interorganizational Management.

General management functions such as strategy formulation, policy formulation, planning, and controlling provide a good leverage point where IT can be effectively deployed to implement FCT. Human resources management issues include staffing, training, empowering, co-locating, telecommuting, and performance measuring; product/service management includes identifying, positioning, innovating, marketing, and distributing functions; operations management deals with issues such as scheduling, standardizing, integrating, eliminating, and automating; and interorganizational management concerns issues such as networking, partnering, risk-sharing, and outsourcing. These points of leverage identify application areas where FCT and IT can be effectively used together.

A FCT-IT STRATEGY FRAMEWORK

With the help of the FCT leverage points identified above, we can identify specific IT strategies that can be used to successfully implement FCT across the organization. Figure 1 shows the proposed FCT-IT strategy framework. The IT strategy dimension represents the various broad strategies that could be employed to successfully identify and implement FCT; the FCT dimension identifies the points of leverage where FCT would lead to a high payoff.

Figure 1. FCT-IT Strategy Framework

[Diagram of FCT-IT Strategy Framework]
Preempting strategy refers to the ability to secure an advantageous position that is difficult to dislodge because of the advantage it has captured by being first (MacMillan, 1983). Specific stages in the preempting strategy includes finding the exploitable link, capturing the pole position, and keeping the gate closed (Feeny & Ives, 1990). A barrier-raising IT strategy creates switching costs so that followers must invest extra resources to attract customers away from their competitors. Supplier-specific learning by the buyer is the category of switching cost that is by far the most common. Flexibility IT strategy allows firms to overcome entry barriers in growth industries and exit barriers in declining industries. IT has the capability of expanding geographical reach or extending levels of operation. A responsiveness IT strategy delays the competitor's response time by achieving a greater cost/time reduction and improvement in customer satisfaction. Risk management IT strategy is concerned with utilizing financial or operating leverage in pursuit of the FCT goal.

The above suggested IT strategies may be used at various FCT leverage points depending on the organization's priorities and competitive need. The above framework provides a point of reference to plan for IT deployment in FCT implementation success. It is, of course, necessary to identify within the overall framework specific information technologies that might be effectively employed in order to achieve the objectives of FCT in the organization. In addition to identifying specific technologies to facilitate FCT, there needs to be a checklist of procedures and practices that would guide the FCT process through.

**BEST-IN-CLASS FCT PRACTICES - SUGGESTIONS**

The need for an underlying FCT culture is often cited as the single most important "resource" that an organization can possess (Meyer, 1993). However, in addition to the culture, which manifests itself in the operating philosophy or corporate culture, we garnered some "tips" from successful FCT projects implemented in leading organizations to draw up a best practices list.

**OPERATING PHILOSOPHY**

The need for a clear, customer-driven context of doing business is paramount to the success of any FCT project (Smith & Reinertsen, 1992). Also, the value addition to every product/service should be the guiding premise of the FCT organization. Fostering an environment where information is shared openly and trustingly, and employees are empowered to make decisions in real-time are some of the essential ingredients of an FCT conducive operating philosophy.

**ORGANIZATION ARCHITECTURE**

Mission focused structures emphasizing value addition rather than portfolio expansion is a conscious undertaking for the successful FCT organization (Meyer, 1993). In order to ensure the permeation of the FCT approach, the organization's business architecture has to be
organized on a responsive, flatter-bed type of structure rather than strictly hierarchical structures. The concepts of co-locating and telecommuting could be used to promote multifunctional and team-based work in the organization (Wetherbe, 1995). Redesigning work to facilitate FCT process is an important feature of a successful organization (Keen, 1991). In this new organization climate, partnerships with suppliers, customers, and competitors is the norm.

LEADERSHIP

The need to have a definitive purpose, mission, and goals folded into an evocative vision is an important one that triggers an FCT organization (Senge, 1990). The leadership of an FCT organization should have the necessary vision, purpose, and strategy mapped out in the form of an organization-wide blueprint. Ensuring that the organization develops as a learning system should be the major objective of the top management in order for the organization to be a successful FCT organization.

BUSINESS STRATEGY

A definitive business strategy should have bold cycle time reduction goals. Pursuing the twin goals of process development with product development is the focus of an FCT goal directed business strategy (Meyer, 1993). Instituting time sensitive performance metrics are essential to provide feedback and monitor FCT results.

CONCLUSION AND RECOMMENDATIONS

The basic constructs of FCT and the role of a well-articulated IT strategy were delineated here with an aim of providing practical guidelines to practicing organizations. The proposed FCT-IT strategy framework provides a useful methodology to identify FCT opportunities both within and without the organization and effectively apply IT strategies in order to implement successful FCT. Organizations have to consciously introduce ways and means to reduce time, pare down costs, and improve customer satisfaction. These aspects of business are no longer a luxury; they are very much a necessity in today's global environment.
REFERENCES


