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ORGANIZATIONAL CHANGE AND ORGANIZATIONAL LEARNING IN TECHNOLOGICAL LEAP-FROGGING

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Abstract

This article explores the dynamics of change as a result of an organization’s attempt to modernize itself in the face of new technological advances. Some organizations seek out innovations in technology and information systems as a continuous incremental effort to adapt to change while others embrace the latest technological breakthrough as a revolutionary change. The paper attempts to answer two fundamental questions: First, is the by-product of organizational change, the learning how to change, more a source of competitive advantage than the improvements in efficiency that this technology brings? Secondly, can a leap-frog into the latest technological advances become a sustained competitive advantage?

Keywords: Organizational change, IT-adoption, strategy

Introduction

Because change seems universal and has been accelerated by technological developments, organizations must follow suit in their endeavors to incorporate and adopt technology, thus initiating the process of organizational learning. The process of learning prompts further changes in the organization and its surroundings. Because change is possible there are always choices and in choosing among these, conflict surfaces. Change that is cyclical is comforting because it is predictable, but revolutionary change brings chaos to the order organizations strive to obtain. This study compares the differences in performance between organizations that exhibit pioneering change versus strategic change. In addition, this study explores the concept of sustained competitive advantage to see if technological leapfrogging can become a permanent source of a competitive edge. Michael E. Porter (1996) lists the characteristics of sustained competitive advantage. Sustained competitive advantage is achieved if there is a unique competitive position for the company, activities are tailored to strategy, and there are clear trade-offs and choices vis-à-vis competitors. Competitive advantage arises from fit across activities and sustainability comes from the activity of the system and not its parts. Operational effectiveness is a given (Porter, 1996).

Conceptual Background

Change

Van de Ven and Poole (1995, p.512) state that change is “an empirical observation of difference in form, quality or state over time in an organizational entity.” Van de Ven and Poole outline four types of theories that explain change. These are life-cycle, teleology, dialectics and evolution. Life Cycle closely refers to organic growth from initiation to death or termination. As an example of the application of Life Cycle Theory, the stages in the product life cycle can be examined as introduction, growth, maturity and decline. Change in the life cycle theory is a cumulative progress where there is a common underlying process and characteristics acquired in earlier stages are retained in later stages. Teleological theory explains that a purpose or goal guides change. Development, or the process of change, proceeds toward a planned or envisioned end state. This end state can be continuously modified as a result of ongoing evaluations. External influences may push the process towards a new path. Dialectical Theory embraces opposing views in constant conflict. A temporary tip of the balance on to one side explains change. This is envisioned as a win-lose situation. Finally, evolutionary theory views change in terms of a cycle of variation, selection and retention, similar to Darwin’s survival of the fittest theory (Van de Ven and Poole, 1995).
Romanelli and Tushman’s (1994) punctuated equilibrium model of change suggests that there are long periods of small, incremental change, or equilibrium, interrupted by brief periods of radical change, or punctuation. During long, stable periods of an organization’s life, change is limited to incremental modifications that stay within the established strategic orientation. Reorientations occur less often as they are revolutionary shifts (Sastry, 1997).

Pioneering firms compete by changing continuously by developing new products and reinventing themselves as a response to the changing environment. Technological pioneering involve market leadership as firms establish new standards and even technological lock-outs of others lagging behind (Zahra, 1995). Moreover, in high-velocity industries the ability to engage in rapid continuous change is crucial for survival. As we witness a growing convergence with telecommunications and consumer electronics, a rise in multimedia applications, assaults on standards, and the Internet explosion have put a premium on the ability to change continuously. From their study Brown and Eisenhardt (1997) suggest a paradigm for dynamic organizations that includes semi-structures for firms that keep them on the border between order and chaos and between the past and future.

Kaoundis (1999) sees the necessity for firms to acquire a widening set of in-house multidisciplinary capabilities and core technological competencies. He argues that organizational learning is an antecedent to the internalization of new techniques into new components, devices, systems, products and services that cut across traditional industry boundaries. Evidence supported in the literature “indicates that the most successful corporations are those that have developed a clearly defined technology strategy that is then fully integrated into corporate strategy and vigorously managed at senior-management level and, of course, communicated to all levels of the company” (Kaounides 1999, 61).

Proposed Framework

As we can see in Figure 1 the model proposes two key dimensions defining change. The dimensions propose the integration of the four theories explaining change into an orthogonal relationship of pace of change and intensity of goal setting and planning. The intersection of these dimensions identifies four types of change. Quadrant I, Dialectical, reflects a fast-paced unguided change marked by internal conflict and opposing forces that initiate change in their constant battling. Quadrant II is Life Cycle Change marked by slow paced unplanned change, but rather change that evolves as a consequence of maturation. Yet this maturation is unguided by organizational goals. Quadrant III reflects a high-paced planned type of change that involves high-speed selection and retention of alternatives. This quadrant is named Darwinian. Quadrant IV, Teleological Change is marked by slow, incremental changes that is driven by organizational goals. This change is planned and highly strategic.

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<table>
<thead>
<tr>
<th>Unplanned</th>
<th>Fast Pace</th>
<th>Slow Pace</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unplanned</td>
<td>Revolutionary</td>
<td>Strategic</td>
</tr>
<tr>
<td>Goals</td>
<td>Reflexive Change</td>
<td>Imitating Change</td>
</tr>
<tr>
<td>Guided</td>
<td>Pioneering Change</td>
<td>Crafted Change</td>
</tr>
<tr>
<td>Planned</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goals</td>
<td></td>
<td></td>
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</tbody>
</table>
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Figure 1. Model of Types of Change

“Researchers who use the learning lens perspective provide a richer theoretical description of strategic change by opening the black box of managerial processes (i.e. by focusing on how managerial actions shape readiness and resistance to strategic change and overall outcomes of the change process)” (Rajagolopan, 1997, 61). Change produces incompetence in organizational processes. Managers must adapt and learn and create new processes that match or fit with the new environment. This takes time and in the meanwhile performance will be lowered. Low performance may trigger new changes, however what is required is an improvement in competence, not a new change that will create further incompetence (Sastry, 1997). “Decision makers are subject to bounds on their rationality as imperfect knowledge and expectations take time to update,” (Sastry, 240). Change that is revolutionary is fast paced and not strategic because strategy requires crafting. Craft evokes traditional skill, dedication, perfection through mastery of detail developed through long experience and commitment (Mintzberg, 1987). Mintzberg (1987, p.66) states, “Formulation and implementation merge into a fluid process of learning through which creative strategies evolve.” This explains why our conceptual model divides revolutionary and strategic change as fast and slow paced, respectively.
Organizational Learning

As technology-based competition intensifies, firms must develop a competitive advantage through its commitment and internalization of these technologies. The planning and management of technology must be consistent with business objectives at the organizational level (Ward and Griffiths, 1996). Firms gain efficiency with their innovation capabilities as they apply technology in the pursuit of business objectives. More importantly, corporate strategy itself will vary in its emphasis and ability to identify and utilize technological opportunities. Firms have found it necessary to concentrate on core assets that they have accumulated over time. As products become more complex they merge diverse technologies into one. Integrated systems or solutions challenge in-house expertise, competencies and skills.

Organizational learning relates to the technology perspective of network alliances. Collaboration comes as a response to new demands in know-how and technological capabilities. Transaction costs, though important are not the main focus. Yet this does not imply that transaction cost savings and immediate returns are not as vital as technical enhancements. Alliances are an important part of a learning process for firms (Osborn and Hagedoorn, 1997). “Perhaps learning via alliances and networks is faster since it may not call for individuals and units to unlearn traditional routines. Perhaps the net benefit from participation is not as much what a firm learns from a specific alliance or network as it is the increase in the firm’s learning capacity” (Osborn and Hagedoorn, 270). Rajagolopan and Speitzer (1997) state “Researchers who use the learning lens perspective provide a richer theoretical description of strategic change by opening the black box of managerial processes (i.e. by focusing on how managerial actions shape readiness and resistance to strategic change and overall outcomes of the change process)” (Rajagolopan and Speitzer, 61). Change produces incompetence in organizational processes. Managers must adapt and learn and create new processes that match or fit with the new environment. This takes time and in the meanwhile performance will be lowered. Low performance may trigger new changes, however what is required is an improvement in competence, not a new change that will create further incompetence (Sastry, 1997) “Decision makers are subject to bounds on their irrationality as imperfect knowledge and expectations take time to update” (Sastry, 240).

Venkatraman (1994) proposes that the potential for Information Technology (IT) to transform business can be categorized into five levels. These are localized exploitation, internal integration, business process redesign, business network redesign and business scope redefinition. As the organization internalizes IT technology, it begins to change its processes. This, in other words, is organizational learning.

Proposition 1: Conditions for organizational learning are improved as the pace of change slows and change is driven by organizational goals.

Proposition 2: Technological leapfrogging will not lead to a sustainable competitive advantage without organizational learning.

Methodology

Brown and Eisenhardt (1997) used the constructs level of improvisation, probing the future, evolution from past to present, and product performance portfolio. These constructs will be used in this study to measure the level of planned or strategic change versus the level of improvised or pioneering change. The sample frame includes top-level executives in charge of making decisions in regards to setting strategies for a company. They will be survey through a mail-survey. The selection of companies is important since they must fall into the parameters mentioned in the study. These companies, or SBUs must be free to make their own decisions regarding the purchase of new technologies and the must be free to make organizational changes of their own choosing. They must be able to adapt production processes and projects at their discretion. They must be working in more than one project that involves technology at the present time. It is preferable to use firms in a fast-paced industry.

Cluster analysis will be used to explore the ability of our proposed typology of change, presented in Figure 1, to account for the differences in project management structures. Multiple discriminant analysis will be used to determine if the independent variables can correctly classify a successful performance portfolio compared to an unsuccessful performance portfolio.

References


**Appendix A. Variables That Determine Success and Failure of Product Innovations**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Type</th>
<th>Measured by Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Performance Portfolio</td>
<td>Dependent</td>
<td>On time to market</td>
</tr>
<tr>
<td>Improvising in the Present</td>
<td>Independent</td>
<td>Within-Project Communication</td>
</tr>
<tr>
<td>Improvising in the Present</td>
<td>Independent</td>
<td>Cross-Project Communication</td>
</tr>
<tr>
<td>Improvising in the Present</td>
<td>Independent</td>
<td>Communication with external firms</td>
</tr>
<tr>
<td>Improvising in the Present</td>
<td>Independent</td>
<td>Identification of who is responsible for profitability</td>
</tr>
<tr>
<td>Probing the future</td>
<td>Independent</td>
<td>Endeavors into experimental products</td>
</tr>
<tr>
<td>Probing the future</td>
<td>Independent</td>
<td>Strategic alliances</td>
</tr>
<tr>
<td>Evolution from past to present</td>
<td>Independent</td>
<td>Predictability of intervals between product introductions</td>
</tr>
<tr>
<td>Evolution from past to present</td>
<td>Independent</td>
<td>Existence of transition procedures</td>
</tr>
</tbody>
</table>

*Source: Brown & Eisenhardt, 1997*