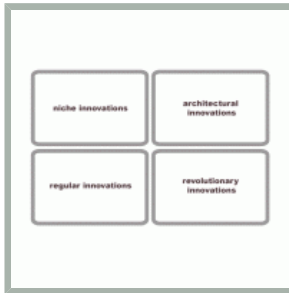


transilience maps



characteristics

author:	Abernathy, W.J. and Clark, K.B.
country:	United States
period:	1985
type:	model
role:	consultant, change agent, manager and programme & project manager
activity:	analyse, plan and reflect
topic:	innovation & risk and change management
abstr. level:	organisation
perspective:	learning
status:	under review
module:	innovation
comments:	1

related models

invention innovation diffusion trilogy

description:

Technology and technology management received little systematic attention in the formulation and implementation of firm policies until the 1980s. In 1985, two Harvard University Professors, Abernathy & Clark, challenged Schumpeter's 1942 "creative destruction" view of innovation and argued that although technological innovation imposes change, this change need not be disruptive for a company. To understand the effect of innovation on a firm, many scholars attempted to study the structural characteristics of innovation within companies (e.g. degree of hierarchy, firm size, degree of focus etc) and administrative practices. Abernathy & Clark developed a model for decision makers to depict a firm's current and future strategy on innovation and to control the firm's order of change.

Their rationale was to map different types of innovations by showing the different properties of innovations likely to either disrupt or entrench existing competencies. The two scholars analyzed the US automotive industry between 1924 and 1949 and concluded that whereas radical innovations can disrupt and make the existing competence obsolete, incremental innovations conserve and entrench existing competences.

In their research, Abernathy & Clark defined innovation as the initial market introduction of a new product or process whose design departs radically from the past practice. The competitive significance of an innovation depends only on:

1. what it does to add value;
2. its applicability to the firm's existing core competences.

Without diminishing the importance of cost as a competitive factor, Abernathy & Clark considered the competitive position of a firm in terms of a variety of dimensions. They assumed that products are not homogeneous, and that firms compete by offering products that may differ in many aspects: performance, reliability, availability, ease of use, aesthetic appearance, and image (among others), as well as initial cost. A firm gains a competitive advantage when it achieves a position in one of these featured dimensions, or a combination of them that is both valued by customers and is superior to its competitors.

It is important to note that the features of a new product, and the firm's position in the market, are not in themselves fundamental sources of competitive advantage. Instead, the foundation of a firm's position rests on a set of material resources, human skills and relationships, and relevant knowledge. These are the competencies or competitive ingredients from which the firm builds product features that appeal to the marketplace.

Abernathy & Clark (1985) divided innovations into two dimensions and drew a matrix of four cells they called the transilience map, a combination of the words transient and resilience to illustrate how different product innovations affect the competitive situation in a certain industry.

Transilience maps show the capacity of an innovation to influence the firm's existing resources, skills and knowledge considering two distinct perspectives. The first perspective focuses on how new technology and manufacturing activities are being organized while the second perspective deals with the activities needed by the firm to service new markets and customers.

These innovations can be grouped into four segments depending on whether innovations conserve and/or destroy a market or whether or not they make the technology obsolete. Each segment has a different competitive impact and each requires different organizational and managerial skills. The quadrants are:

1. REVOLUTIONARY INNOVATION

Innovation that disrupts and renders established technical and production competence obsolete, yet is still applied to existing markets and customers. Not all innovations that fall in the revolutionary quadrant have a profound competitive impact. Some fail to meet market needs while others encounter production problems.

Revolutionary Innovation is dominated by " *Technology Push* ". Firm's management should be capable of sustaining consensus about long-term goals through investments in new technology and innovation. Good technical insight is needed along with an aggressive marketing strategy to change the rules of the game in order to carve out a competitive position.

2. REGULAR INNOVATION

Regular innovation involves change that builds on established technical and production competence and is applied to existing markets and customers. The effect of these changes is to entrench existing skills and resources. "Regular" innovation is often almost invisible, yet can have a dramatic cumulative effect on product cost and performance.

Key factors for Management are methodical planning and consistency. The aim is to achieve volume production and use scale economies to lower costs and improve products. In the regular Innovation, all opportunities must be taken to advance quality, improve product features and remove bottlenecks in the production process.

3. NICHE CREATION

Technology used in the creation of a 'niche' is usually readily available. Opening new market opportunities through the use of existing technology is central to this kind of innovation, but here the effect on production and technical systems is to conserve and strengthen established designs. In some instances, niche creation involves a truly trivial change in technology whose impact on productive systems and technical knowledge is incremental. But this type of innovation may also

appear with significant new product introductions, vigorous competition on the basis of features, technical refinements, and even technological shifts. The important point is that these changes build on established technical competence and improve its applicability in the emerging market segments.

The key skill is sizing up new market opportunities. Management must nurture quick-footed capability to stay ahead of competitors and strive to get maximum profits. Manufacturing should be quick, responsive, insure timely delivery, offer responsive service and adequate capacity for a quick build up.

4. ARCHITECTURAL INNOVATION

The use of new concepts in technology to forge new market linkages forms the essence behind architectural innovation. New technology that departs from established systems of production and, in turn, opens up new linkages to markets and users, is characteristic of the creation of new industries as well as the reformation of old ones. Innovation of this sort defines the basic configuration of product and process, and establishes the technical and marketing agendas that will guide subsequent development. In effect, it lays down the architecture of the industry, the broad framework within which competition will occur and develop.

Management must constantly scan for technological developments and unmet market needs. This requires creativity with keen insight into business risk. Combined with personal experience, the ability to see the application of technologies in a new way is crucial.

Abernathy and Utterback's earlier model (1978) suggested the ways patterns of innovation change as an industry sector matures, and how companies may change themselves to foster innovation similar to the S-curved adoption and diffusion model. The Transilience map of Abernathy and Clark (1985) integrated these two concepts by classifying innovations in distinct groups and offering management ways to deal with different types of innovations. The model highlights the two essential determinants of innovation, namely technology and market.

assets:



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pros:

- The transilience map provides a framework for examining the relationships among innovation, competition and the evolution of industries. It offers distinct approaches for dealing with different types of innovations.
- The framework recognizes that innovation is not a unified phenomenon: some innovations disrupt, destroy and make obsolete established competence; others refine and improve. Therefore, the model provides companies with a framework to develop insights into innovation strategies in relation to the firm's specific competitors.
- The effects of innovation on production systems may be quite different from their effects on linkages to customers and markets. The framework reflects these differences. Thus, categorizing past innovations in a certain industry and making use of the offered managerial insights can provide a guideline to sustain the competitive advantage of the firms.

cons:

- Innovations can be separated using other dimensions such as price or performance attributes, competences required by the producer or the consumer, or their potential to substitute existing products or technologies. Therefore, Abernathy and Clark's two dimensional classification seems to be oversimplified.
- In practice, one finds a continuum of differences rather than a clear-cut dividing line. This implies that a revolutionary innovation of one industry can be a niche innovation for another industry.
- Any classification depends on the perspective of the one who undertakes it, i.e. a novel process technology may barely affect the end user of the respective product while representing a fundamental challenge for the producers.

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