MOT 1410, Mulder
Coen van der Giesen, Kakee Scott
October 18, 2007
Abstract: Albernathy, W.J., Clark, K.B. (1985), *Innovation: Mapping the winds of creative destruction*, Elsevier Science Publishers B.V.

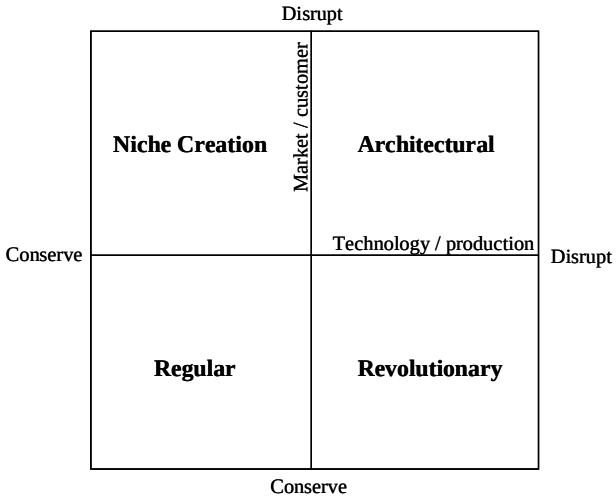
Section 1. Introduction

In the mid-80's, when this article was written, a new group of studies were focusing on the relationship between innovation and competition. Abernathy and Clark's study intended to provide an analytical framework for this new focus and therefore to provide useful business and policy strategies for technological development. Importantly, the framework would deliniate various effects of innovations on existing knowledge, markets, users and production systems.

Section 2. 'Identifying the role of innovation in competition: The transilience map'

Competitive advantage for a firm comes from achieving greater value for the customer and superior status vis-a-vis the competitor in one or more of several dimensions: 'performance, reliability, availability, ease of use, aesthetic appearance, image and initial cost.' A firm's competitive resources are its capital (material resources) and socially embedded competences (the skills, relations, and knowledge) of its human resources. Abernathy and Clark define a term *transilience* as the potential influence of a technology/innovation on these competitive resources, and therefore its 'competitive significance.'

Abernathy and Clark use a matrix framework, a *transilience map* to demonstrate and analyze transilience of different innovation types. The market/consumer (Y-axis) and technology/production (X-axis) status of the innovation are each given two extreme poles of either a conservative or radical/disruptive stance. Four innovation types are derived from the four quadrants of this matrix to show the competitive impact of the innovation. They are: Architectural, Niche, Regular, and Revolutionary inovations.



The 'conservative' pole does not mean that existing technological or market systems are completely preserved/unchanged, but rather refined, or developed further to create more value. The 'disruptive' or radical pole is closely related to Shumpeter's *creative destruction* concept and characterized by a total redefinition of the required technological competencies or market positioning.

Architectural innovation is more or less the idea of what we usually call 'radical innovation,' though in Abernathy and Clark's terms it stems from being a breakthrough in both market and technological spheres. This type of innovation is the source of new industries, and therefore provides the architecture of the new industry- the key market and technical competencies required for competitive participation. These innovations must be radical departure from existing industries, be able to compete in the long term, and be linked but not dependent on scientific development- a lot is determined by for example changes in production lines, market developments the rise of other (related) technologies.

Niche creation comes from the application of existing technological competencies to new market opportunities, and results in a refining of designs to meet previously unmet market/consumer needs. For a niche creation to be successful it must combine good timing with an approach/design that is unique and difficult for competitors to replicate.

Regular innovation is conservative in both spheres so that it is essentially what we think of as incremental innovation. A continuous refinement is practiced within the existing market and technological systems, resulting in increased marginal competitive advantage and further entrenchment of the system. Although actions are more conservative, the effect can be more impressive over the long run than when a radical change is made.

Revolutionary innovation applies new technological systems to establish markets. To be successful it must exceed the established technological system in meeting user needs.

Section 3. 'The transilience map and industry evolution'

Abernathy and Clark discuss how patterns of competitive development for an industry can be illustrated using the transilience map. The four quadrants can be seen as 'phases' of the pattern, so that if a *strategic vector* is created from one quadrant to another, it represents a change in phase for the industry.

One strategic vector shows a transition from an architectural to a regular innovation phase. This is a conventional process where a new industry becomes dominant and begins to evolve/refine incrementally to maintain competitive advantage. In this case, *capital embodiment* is the process of replacing human skills with process/machine improvements. While making it possible to achieve economies of scale, it also makes industries vulnerable to dramatic change because its capabilities are tied to more permanent and rigid capital rather than less permanent and rigid skilled labor, which is called *technical rigidity*.

However, technical regidity is not a certain outcome of regular innovation. Another strategic vector moves from regular to niche innovation. In regular innovation, the economies of scale and mechanical efficiency can create a situation where fewer but more sophisticated machines can handle greater production diversity to meet more market needs. This results is increased *versatility* and can move the industry into the direction of niche development.

In a third strategic vector, an industry escapes the regular phase and moves into either a revolutionary (radical market changes) or architectural phase (combined radical technical/market changes.) In this case, the existing technological system is unable to adequately meet market demands and therefore it is weakened and radical changes are required to maintain a competitive advantage. This is a sort of rare *reversal in development* or *'de-maturity.'* Such a situation can be influenced by the appearance of technical alternatives either within the industry or from new competitors, new market demands, or policy changes, such as new regulation or de-regulation of the industry.

Section 4. 'Managerial implications and conclusions'

Abernathy and Clark begin to make some conclusions about what management styles are most suited within each of the innovation types/phases. For the architectural phase, a proper understanding and fostering/management of creativity and risk are essential, as well as a creative matching of new technologies and markets. In the niche creation phase, greater focus should be paid on exploiting market opportunities and strategic timing. In the regular phase, stability and consistency in planning, design, and management are key for process and product improvements, along with a parrallel focus on economies of scale and protection from harmful external changes. In the revolutionary phase, long term strategy, technical savvy and a keen competive edge are essential to break into existing markets.

In these industry transitions (strategic vectors), new firms replacing existing firms because of their better capabilities in dealing with the management requirements of the new phase. Therefore, an overall strategic lesson that large dominant firms can gain from the trasilience framework is to integrate the skills required for several phases in order to maintain a competitive foothold.