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A dynamic framework for competitor identification: A neglecting role of dominant design

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ABSTRACT

This study develops a general framework of competitor identification by using the similarities of capabilities and markets between the focal firm and its competitors, and particularly the influences of the emergence of a dominant design to delineate the competitive dynamics of interfirm rivalry. A case study of the smartphone industry confirms the predictive validity of the present framework. This study contributes to the advancement and clarification on the research of competitor analysis as well as dominant design on several fronts: (1) explaining why the development process of a dominant design is a critical factor in identifying potential competitive threats; (2) clarifying the conditions which cause firms to initiate high-risk attacks; (3) explaining motives for competitive threats from the market and the value chain as well; (4) deepening the understanding of the mechanisms by which a dominant design influences the competitive behaviors of incumbents and suppliers.

1. Introduction

Before formulating a competitive strategy, the most important task for firms is to identify their major competitors (Chen, 1996; Peteraf & Bergen, 2003; Porter, 1980; Wu & Olk, 2014). Chen (1996) first utilizes two dimensions, resource similarity and market commonality, to predict dyadic firms' competitive behaviors in the airline industry. Later, Peteraf and Bergen (2003) modify the construct of resource similarity in Chen (1996) as the one of capability equivalence to illustrate the competitive dynamics in the cereal industry. These two leading articles contribute to a broad theory of heterogeneity by deepening strategy of scholars' understanding of how market-side and resource-side factors influence the behavior of competitive rivalry especially in technologically stable environments, such as airline and food industries.

In turbulent environments, innovative technologies emerge very fast, resulting in shorter product lifecycles. The advent of a new dominant design after a technological breakthrough destroys the balance of the market (Anderson & Tushman, 1990). To defend their market positions, the incumbents with obsolete designs may initiate attacks against the firm with a new dominant design. Therefore, the competitive relations among firms before and after the emergence of the dominant design may be quite different (Srinivasan, Lilien, & Rangaswamy, 2006; Teece, 1986). Previous studies on competitor identification devote particular attention on resource-side and market-side factors, but neglect the role of dominant design in terms of identifying potential competitors, which may deter or mislead managers' responses to the competitive attacks.

Building on the works of Chen (1996); Peteraf and Bergen (2003), and Anderson and Tushman (1990), this study attempts to contribute to the theories of competitor analysis and technological innovation by proposing a general framework of competitor identification, which includes the dimensions of dominant design, capability equivalence, and market commonality to delineate the competitive dynamics of interfirm rivalry.

The remainder of this article proceeds as follows: the second section introduces the concept of dominant design and reviews the theories of competitor identification; the third section describes the present framework; the fourth section provides a case study of the smartphone industry for illustrating the present framework and finally, the fifth section presents the discussion and conclusions of this research.

2. Literature review

2.1. Dominant design initiating competition

A dominant design is a specification consisting of a single design feature or a complement of design features, which defines a product category's architecture (Srinivasan et al., 2006). "Dominant designs emerge from each breakthrough innovation as manufacturers, suppliers, customers, and regulatory agencies compete to decrease the uncertainty associated with variation during the era of ferment" (Anderson & Tushman, 1990, p. 614).

When imitation is possible and occurs, followers have a good chance of entering an industry in a window around the time a dominant design

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emerges and even subsequently turning their modified product as the dominant design. If a firm developing the design can obtain the necessary complementary assets and prevent others from imitation, the firm may monopolize the innovative rent for a period of time (Teece, 1986). After a dominant design emerges, competition moves to the leading position of the design.

2.2. Competitor identification

Recent studies of competitor identification shift the research focus from the analysis of the whole industry structure to the pair-wise relationships among firms (See the review of Wu & Olk, 2014). Chen (1996) first develops a framework of competitor identification with two firm-specific constructs: market commonality and resource similarity. Market commonality reflecting the degree of multimarket contact between two firms determines whether they are direct and immediate competitors. Resource similarity reflects the extent to which a given competitor possesses strategic endowments comparable, in terms of both type and amount, to those of the focal firm. Firms with similar resource bundles are likely to have similar strategic capabilities as well as competitive vulnerability in the marketplace. Each firm has a unique market profile and strategic resource endowment, and a pair-wise comparison with a given competitor along these two dimensions can illuminate the pre-battle competitive tension between these two firms and to predict how a focal firm may interact with each of its competitors.

Borrowing from Chen's model, Peteraf and Bergen (2003) classify candidate competitors on the basis of similarities in terms of the market needs served and their resource endowments. They point out that managers may pay too much attention to rivals with the same types of resources, while neglecting rivals with dissimilar resource bundles that can also satisfy market needs (Peteraf & Bergen, 2003). To counter this confusion, the two researchers then propose the construct of capability equivalence and define it as the extent to which a given firm has resource and capability bundles comparable to those of the focal firm, in terms of their ability to satisfy similar customer needs. By categorizing resources in regard to functionality and use, Peteraf and Bergen's construct of capability equivalence addresses a supply-side bias and expands awareness of what lurks on the competitive horizon.

On the market side, Peteraf and Bergen's market needs correspondence, however, may not precisely capture the competition threats of the focal firm. In a globalized economy, firms compete with their rivals in both geographic markets and different product markets at the same time. Thus, Chen's construct of market commonality grasps more comprehensively the concept of competition intensity, the degree of presence that a competitor manifests in the markets overlapping with the focal firm in terms of the number of geographic markets and product categories.

Chen (1996) and Peteraf and Bergen (2003) shed light on determining the resource-side and market-side sources of competition, but these two studies neglect the influences of technological changes and potential threats from complementors. In technology-driven industries, innovations may change the sources and motives of competitive threats. Once accumulating sufficient experiences with certain technologies, incumbent firms may fall into the trap of existing technologies or may overlook alternative opportunities (Levinthal & March, 1993). Incumbents' strengths may instead become obstacles when succeeding innovation occurs in other firms of the industry and, thus, force the incumbents to extort from or deter innovators with actions, such as patent litigation (Clarkson & Toh, 2010; Sherry & Teece, 2004).

Another circumstance is that innovation may promote cooperation between firms and their suppliers, and perhaps turn them to compete with each other in the next stage. In order to increase efficiency and gain the "innovative rent" in time, firms may cooperate with their suppliers by means of outsourcing. From the perspective of the value-based business strategy (Brandenburger & Stuart, 1996), cooperation of firms and their suppliers may create added values through improved product and better services. However, after competitors catch up, the reduction of profits may evoke bargaining between firms and their suppliers. Powerful suppliers may extend their market boundary to downstream industries by vertical integration and vice versa (Grant, 2002). The knowledge and technologies that firms transferred to their suppliers or clients may become weapons against themselves.

3. A framework of competitor identification

Firms, in fact, may encounter direct competition from rivals in the market as well as vertical competition from suppliers and/or customers. This study develops a framework for technological competitive threat identification, which builds on the concept of technology cycles (Anderson & Tushman, 1990) and the competitor identification frameworks of Chen (1996) and Peteraf and Bergen (2003). On the resource side, we adopt Peteraf and Bergen's (2003) construct of capability equivalence; on the market side, we adopt Chen's (1996) construct of market commonality. In particular, this study incorporates the construct of dominant design into the framework to interpret the roles of firms relating to the focal firm in quadrants before and after a dominant design emerges. Fig. 1 provides a schematic representation of the framework.

Notably, this study considers vertical complementors including suppliers and customers of the focal firm as potential competitors for operating margin as well as the dominant design. The present framework facilitates the identification of the sources of potential threats, such as dominant design competitors, followers, imitators, market position competitors, and operating margin competitors, before and after a dominant design emerges.

Frameworks of Chen (1996) and Peteraf and Bergen (2003) are appropriate when an industry is mature (Wu & Olk, 2014). During the mature stage, roles in all quadrants of their frameworks are relatively stable. However, considering the technological competitive threat in a turbulent time, the roles of firms in the quadrants become unstable. For helping managers perceive competitive threats, the present framework assesses competitive tension through the lens of the firm with the dominant design, and on a pair-wise basis, to identify the roles of other firms that are located in different quadrants before and after the emergence of a dominant design in a product market.

3.1. The development stage of a dominant design

When a technological breakthrough motivates firms in the high-tech sectors to develop a new product or improve features of their products, a narrow class of designs begins to emerge as more promising. Before a dominant design emerges, several promising designs are competing with that of the focal firm (Quadrant I of Fig. 1). On the other hand, due to learning myopia (Levinthal & March, 1993), structure inertia (Hannan & Freeman, 1984), and path dependence (Teece, Pisano, & Shuen, 1997), the incumbent firms whose capability equivalence may be lower in terms of the focal firm's promising design tend to observe the process of technological changes (Quadrant II of Fig. 1).

In most cases, successful commercialization of an innovation needs to integrate the know-how in question with other capabilities or assets, such as marketing and after-sales service (Teece, 1986). In order to have access to complementary technologies, firms with the promising technology of a complex product may cooperate with other firms which target other product markets at that time (Quadrant III & IV of Fig. 1). The capability equivalence of the secondary complementors and potential complementors is low in terms of the promising design while that of the primary complementors is high.

3.2. The growth stage of a dominant design

During the growth stage of a dominant design, competitors (refer to Quadrant I), who competed for the dominant design with the focal firm in the previous stage, may keep improving their designs or turn to