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Technology strategies and standard competition — Comparative innovation cases of Apple and Microsoft

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ABSTRACT

This paper analyses the technology strategy and standard competition of the most outstanding innovation cases of Apple and Microsoft. The objective of the study is to understand innovators' pursuit of strategies in securing the benefits from an innovation, based on the innovation life cycle model. The study develops a new methodological framework of platform for analysing the case studies. It is argued that the ability to establish an industry standard and lock-in customers enables an innovator to create a competitive advantage. The study offers important lessons in strategic innovation management.

1. Introduction

Competition to achieve competitive advantage often involves the ability to establish new standards for the interworking of products and services. The outstanding classic cases of standard battle are Sony Betamax and Matsushita VHS standards in the Videocassette Recorder (VCR) business, the standard competition among the powerful players of Visa Open Platform, MasterCard/Mondex Multos, Proton World's Proton, Microsoft Windows for Smart Cards in the smart card industry and the recent standard competition between HD-DVD and Blu Ray in the Digital Versatile Disc player (DVD) business. This study endeavours to understand the use of technology strategies and competition to establish technology standards in the most outstanding innovative companies of Apple and Microsoft. The comparative case study analyses using the new methodological framework of platform aim to contribute to the area of innovation management.

Following the introductory section, Section 2 presents the literature review on innovation, innovation process, five forces Porter's approach, technology standards and platform and strategies in managing technological innovations. Section 3 introduces the new methodology for analysing the technology platform creation process. Section 4 analyses of the process of technological change in various industrial sectors in an attempt to provide a basis for better understanding the technological change of Apple and Microsoft, based on the innovation life cycle model. Section 5 analyses the technology strategies of Apple and Microsoft for achieving competitive advantage. Section 6 discusses the generalisable principles/abstract ideas synthesised from the case study analysis. Section 7 concludes the paper by drawing lessons in strategic innovation management from the findings and suggests avenues for future research.

2. Theoretical framework

2.1. Innovation and innovation process

Innovation is a process of transforming the technology frontier into the commercialised product/process innovation in a competitive market (Daft, 1982; Rothwell & Gardiner, 1985; Schott, 1981). The innovation process characteristically exhibits an S

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pattern. The stages along the S-curve are characterised by the efforts of the innovator to adapt a technological development (invention) for transformation into an innovation (commercial product). The innovation process can be described by the forces of technology push (Schumpeter, 1939) and demand pull (Schmookler, 1962) or their interaction (Freeman, 1982) as triggers of innovation. Technology push views the innovation process as simple linear and sequential with emphasis on research and development. Demand pull views the innovation process as simple, linear and sequential with emphasis on the market (Brem & Voigt, 2009; Hung, 2010; Matthyssens, Vandenbempt, & Berghman, 2006).

Given the competitive environment of the innovation/diffusion process in the industry, Utterback and Abernathy (1975) developed the innovation life cycle model to describe the process of innovation and the degree of technological change (Fig. 1). The analysis of the innovation process in this paper is based on the concept of innovation life cycle since the model provides a basis to understand a process of commercialisation. It is argued that the industry plays an important role in the innovation process since innovations are developed along with the markets for them. According to Fisher and Pry (1971), when a new innovation reaches about 5% penetration of the potential application market, it provides a reasonable base for forecasting the speed and ultimate penetration achievable.

Vernon (1966)'s Product Life Cycle (PLC) is a classical model explaining the development as a pattern of product substitution (the S-curve pattern). The phases along the PLC reflect innovation diffusion — the progress of product/process innovations along the stages of introduction, growth, maturity and decline. Vernon's PLC shows a progression of innovation from process innovation to product innovation (Fig. 2).

2.2. Five forces Porter's approach

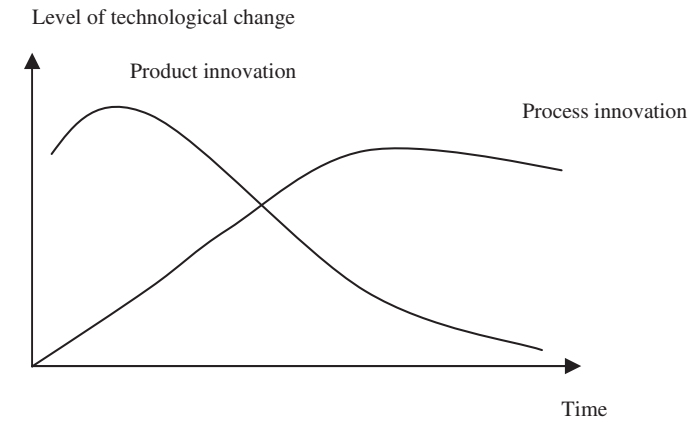
The influential work in innovation strategy is owed to Michael Porter (1980, 1985). Porter emphasised the use of competitive strategy as the way to achieve competitive advantage in the 1970s and 1980s. His notions are based on the resource-based approach by Barney (1986), Cool and Schendel (1988), Penrose (1959), and Wernerfelt (1984, 1989) who argue convincingly that strategies to cope with a changing competitive environment are associated with the firm's capabilities. The firm's capabilities have been described as amalgam of resources — technology, organisational capabilities, experiences and relationships (Fahy, 1996; Reed & DeFillippi, 1990).

Porter pioneered the 'Five Forces' approach for analysing the firms' strategic position. The five forces of competitive position model are: relations with suppliers; bargaining power of buyers; threats of new entrants; threats of substitute products or services; and rivalry amongst existing firms (Fig. 3). He argues that a firm's strategy is influenced by these forces and suggests the firm to find a position in an industry to defend itself against the forces or to influence them in its favour (Porter, 1980).

2.3. Technology standards and platform

In the path of innovation diffusion, standards can affect the environment of competition (Hawkins, Mansell, & Skea, 1995; Wonglimpiyarat, 2005). The ability to establish standards could provide a technology platform allowing the innovation to progress from a firm level towards a country or even a global level. The level of innovation commercialisation suggests two patterns of development:

(i) The pattern of development *with uniform standardisation*. The diffusion requires standardisation among multiplayers as in the case of credit cards, debit cards, mobile telephony, containerisation and electronic data interchange (EDI). Many players interacting with other system users on real time basis for low value transaction enforce standardisation.



Source: Utterback and Abernathy (1975)

Fig. 1. The innovation life cycle model. Source: Utterback and Abernathy (1975).