Chapter 20
Knowledge Absorptive Capacity for Technological Innovation Capabilities: The Case of Korea

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ABSTRACT

This chapter presents the development stages of a theoretical model of Knowledge Absorptive Capacity (KAC) that shows how most, if not all, firms in developing countries initiate, implement, assimilate, improve, and develop external knowledge. The chapter reviews the literature, models, and frameworks related to knowledge absorptive capacity. The chapter utilizes a qualitative content analysis as an explanation method in case study research to validate the proposed model. The chapter then analyzes Korean firms as a case in point to illustrate how Korean firms have built their knowledge absorptive capacity. The model consists of four stages: 1) knowledge initiation, 2) knowledge imitation, 3) knowledge improvement, and finally, 4) knowledge innovation or 4KI. The framework shows four development stages at Korean firms as: 1) entrance of foreign companies into the Korean market and their reluctance to transfer their knowledge and information sharing to Korean firms, initiating its knowledge absorptive capacity, 2) Korean firms started knowledge absorptive capacity by means of imitating knowledge from external (especially foreign firms), 3) it then developed knowledge absorptive capacity by means of improving external knowledge, and finally, 4) capability to create their own knowledge and becoming one of the leading economy in the world which challenges firms from advanced countries in the global market. The chapter also highlights the developmental changes in the electronics industry of Korea. Keeping past experiences in consideration, the authors conclude that this model provides useful implications for developing economies, known as latecomers following the same pattern of KAC.

DOI: 10.4018/978-1-4666-4769-5.ch020

INTRODUCTION

The growth of any industrialized economy could be affected by many economic, social, technical and development factors. Knowledge absorptive capacity (KAC) may be one of the most prominent factors which is an integrated outcome of many factors input (Kim, 1995). Both in developed and developing countries, practitioners and academics have mutual consensus that establishing and sustaining competitive advantage no longer merely depends on internal knowledge but rather effectively utilizing external knowledge, and exploiting knowledge to generate new innovation and knowledge (Fabrizio, 2009; Gebauer et al, 2012; Kogut and Zander, 1992; Teece et al, 1997). Also modern economies in the "knowledge society" are not based on factors of production such as capital and labour as much they are based on knowledge, which became the key factors of development and key element in production process (Davenport and Prusak, 1998; Drucker, 1968; 1993; Murovec and Prodan, 2009).

Many prior studies in developed countries (Cohen and Levinthal, 1990; March, 1991; Nelson and Winter, 1982; Nonaka and Takeuchi 1995; Utterback 1994) and developing countries (Kim 1997) have made significant research progress in learning, innovation and technology. Research on KM, KAC, learning organization, technological learning, innovation and creativity is still limited in developing countries (Kim, 1997). Most of developing economies - known as late-comers technological capabilities, leapfrogging innovation and catching up process are based on *initiation-imitation-improvement-innovation* of knowledge and technology borrowed from external sources (especially advanced countries). Even technological innovation and capability of many advanced countries is base on the same pattern (Kim, 1980; Ozawa, 1974). Cohen and Levinthal (1990) argue that the external sources of knowledge are often critical to the organization process and innovation capabilities because most of innovation results from borrowing rather than invention (March and Simon, 1958). The economic development of a country depends upon the capacities of its individual members and the development of organizations. Since firms also play a pivotal role in industrialization, so primarily this chapter deals with firm's KAC and its relationship with technology. This chapter attempts to analyze the process model of KAC by analyzing various studies of KAC at the Korea [Samsung Electronics Company (SEC); hereinafter Samsung] as a case in point. The chapter also reviews models and frameworks related to KAC which are proposed in the context of both at individual and organizational levels. The objective of this chapter is to examine the organizational KAC by analyzing as the case of DRAM (Dynamic random-access memory) for its technological knowledge and innovation at Samsung. Samsung's rapid technological learning and emerge as the first innovative company of South Korea (hereinafter Korea) in a very short time raises several research questions.

1. Korea was a latecomer and many international firms in advanced countries were leading electronics industry, what are the factors that contributed to Korea's knowledge creation?
2. As a late comer in industry, how does Korea absorbed knowledge so expeditiously?
3. Korea has emerged as one of the leaders in electronics industry, especially in the semiconductor, LCD and mobile phone, what are the technological learning strategies that Korea has developed to led to its success?
4. Can other firms in developing countries imitate the knowledge absorptive capacity model of Korea?

This chapter chooses both descriptive and exploratory research design which leads the chapter to conclusive research design. The chapter utilizes a qualitative content analysis approach along with historical case-based analysis of the KAC, DRAM