

Chapter 7

Disruptive Technologies, Innovation, and Competition in the Digital Economy

ABSTRACT

In this chapter, a general overview of innovation (definition and typologies) is presented based on economics and management of innovation literature. Since the pioneering work of Schumpeter (1934, 1942), a growing body of literature has concentrated on technological change in industries. Technology is one of the main factors shaping environmental conditions of firms. The dynamics of innovation and technology may require several approaches to be analyzed. Innovation in various sectors is driven by standards and/or patents and other Intellectual Property Rights (IPR). Standards and patents are helpful for tracking globalization patterns. The current digital economy is characterized by fierce patents and standards battles. Standards and patents are helpful for tracking globalization patterns. The increasing development of Internet traffic and some of the key enabling technologies for the new digital economy called disruptive technologies are introduced.

INTRODUCTION

The management of technological innovation is one of the most demanding challenges today (Dodgson et al., 2008). The external environment characterized by globalization, convergence (see chapter 8), competitive/market uncertainty, time-to-market pressure, shortening product lifecycles is also based on knowledge, information, fast-changing technology and innovative economy. In the recent few years a series of innovations and trends have changed the way people perceive

technology. The global availability of the Internet, along with new innovations (innovation comes in a variety of products, services and applications) explains certain aspects of the dynamics of the innovation process and the diffusion of technology across industries or countries. For advanced industrial economies, the information economy is already a leading edge from which national wealth flows and a key to improving competitiveness.

The intensification of technological competition between countries forces companies to give priority to innovations. Players in the digital

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economy remain fierce competitors on their respective markets, with members including rivals such as Apple, Microsoft, and Google. By delivering ground-breaking innovations that meet the changing needs of both customers and companies as a whole, these Internet giants maintain their technological advance and represent one of the main drivers of the digital landscape.

In section 1, we use concepts from economics and management of innovation literature to present a general overview of definition and typologies of innovation. Since the pioneering work of Schumpeter (1934, 1942) a growing body of literature has concentrated on technological change in industries. Technology is one of the main factors shaping environmental conditions of firms. The dynamics of innovation and technology may require several approaches to be analyzed.

Section 2 is dedicated mainly to the issue of technology battles. Innovation in various sectors is driven by standards and/or patents and other intellectual property rights (IPR). Standards and patents are helpful for tracking globalization patterns. We analyze whether strategic motives for patenting influence the characteristics of companies' innovation.

We present in section 3 the increasingly development of Internet traffic and some of the key

enabling technologies for the new digital economy called also disruptive technologies.

EXPLORING KEY ISSUES IN INNOVATION

Innovations are multiple and vary according to several dimensions: type of the innovation, type of the organization in which the innovation took place and, the environment/sector in which the innovation was developed.

Innovation and Technical Changes

Several scholars consider that the need for innovation is crucial (Tidd et al., 2005). "It's war: Innovate or die." (Cooper, 2005, p. 4). Utterback and Abernathy (1975) consider that "a production process [innovation] is the system of process equipment, work force, task specification, material inputs, work and information flows, and so forth that are employed to produce a product or service" (p. 641). The Oslo manual (OECD, 2005) is presented as the foremost international source of guidelines for the collection, use and analyze of data on innovation activities in industry (Box 1).

Box 1. Definitions of innovation

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

The minimum requirement for an innovation is that the product, process, marketing method or organizational method must be new (or significantly improved) to the firm. Innovation activities are all scientific, technological, organizational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. Innovation activities also include R&D that is not directly related to the development of a specific innovation.

An innovative firm is one that has implemented an innovation during the period under review.

Main types of innovation exist:

1. A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics.
2. A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.
3. A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing.
4. An organizational innovation is the implementation of a new organizational method in the firm's business practices, workplace organization or external relations.

Source: Adapted from OECD, 2005, pp. 47-51.

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