

Business Model Innovation– Oriented Technology Management for Emergent Technologies

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THE CHALLENGE IN TECHNOLOGY MANAGEMENT

During past decades the requirements of research institutions and technology-oriented companies has changed radically. Competition for customers and markets, as well as within research and development, is carried out at global level. Furthermore, the high speed dynamics of technology markets lead to constantly shorter product and technology life cycles.

Traditionally, technology transfer into the market was conducted by cost-cutting and/or innovation. However, in many cases research institutions as well as companies concentrated mainly on the improvement of their current value proposition (technology and/or product). Potential in providing new services and organisational innovations as well as innovations within the business model often remained unused. However, sticking rigidly to traditional business methods is often no longer possible and can lead to the viability and survivability of institutions or companies being endangered. In particular, research institutions in the area of applied research face this problem, as their mission is to transfer technologies into the market.

Therefore, it will be increasingly significant for research institutions and technology-oriented companies to pursue developments and trends

in industries such as markets, customer groups, technology fields, etc. and to identify growth areas and applications outside their current market and field of application. Thus, R&D effort can be reached sooner. Different applications often require several concepts of technology commercialisation. The concept can differ in terms of the number of essential partners, the value chain, the kind of value proposition, the kind of revenue achievement, etc. Technology exploitation claims a holistic consideration of all relevant issues in terms of developing new business models for the emergent technology (Nair & Paulose, 2014; Boons et al., 2013).

Unfortunately, the majority of research institutions, as well as technology-oriented companies, do not deal enough with these challenges (Bezerra, Barquet et al., 2013). Often they are not sensitised to, or are rather scared of, the laborious process behind the identification of new markets and professional technology commercialisation. The purpose of this paper is to describe some crucial steps to improve the outcome of technology management, in particular professional technology commercialisation to support institutions of applied research and technology-oriented companies and to detect white-spots in the technology and research landscape from a market perspective to increase efficiency and effectiveness in the development of emergent technologies.

OBJECTIVES OF BUSINESS MODEL INNOVATION-ORIENTED TECHNOLOGY MANAGEMENT

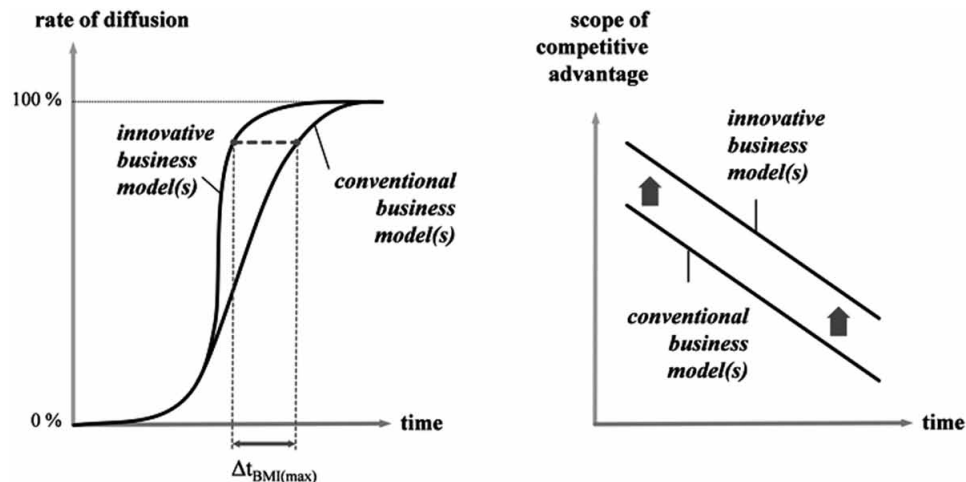
The diffusion of new technologies into the market, even if they have a large potential, is difficult. Many technologies require a period of years before they are adopted by the social system. In some cases, technologies never make it into the market (Baden-Fuller & Haefliger, 2013; Gómez & Vargas, 2012).

The diffusion of emergent technologies into the market needs to aim at increasing the diffusion rate (quantity) and decreasing the adoption time. The diffusion rate is the relative speed at which an innovation is adopted by members of a social system (Rotolo, Hicks & Martin, 2015; Planing, 2014; Rogers, 2003). A good technology diffusion rate implies a bigger market demand and, therefore, greater potential for the company or institution in terms of marketing their technology. Decreasing the adoption time brings advantages in terms of competition as competitors need to develop their technologies and/or adopt their business models in order to address the same market. However, if the gradient is too high, companies and/or institutions can face problems with the provision of the technology to the customer. In this case, the demand is much higher than existing resources

can handle. The big challenge for research institutions and companies is to achieve these objectives successfully. Smart Home Technologies or Green Technologies are examples of how commercialisation has had a huge impact on the success of technology as a whole (Karakaya, Nuur, & Hidalgo, 2016; Bohnsack, Pinkse & Kolk, 2014).

Technology commercialisation and detecting markets at an early stage of technology development has been considered in the research on technology management and for the last 10 years. At the same time, another research topic, called business model innovations, was becoming more and more important. Some leading researchers into innovations announced the idea that business model innovations were more significant than technology innovations. However, some of the business model innovations wouldn't exist without the possibilities of new technology. Nevertheless, business model innovations can boost emergent technologies, so this approach should be used to increase the diffusion rate and enhance the competitive strength of a new technology from the beginning (Figure 1). Business models should offer advantages along the value chain (not only for the end user, but also for all other stakeholders) and dissolve industry structures and market barriers (which could result in competitive advantages). Through new business models, the rate of

Figure 1. Boosting emergent technologies through business model innovations



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