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Ecosystems, strategy and business models in the age of digitization - How the manufacturing industry is going to change its logic

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Abstract

The digital transformation of people's everyday life is progressing; almost everybody uses connected devices, shares information and builds a network according to the existing preferences or needs. A similar development takes place in the industrial environment, e.g. the IT- and software industry is already organized in deeply connected ecosystems. In ecosystems there are different strategic roles an organization can play, which affects an organization's business strategy. If the firm is aware of this fact, it can adapt its strategy after having analyzed its position in the surrounding ecosystem. The strategy is implemented by an according business model. This business model will cause the active change of the organization's role in the ecosystem and the digitization offers opportunities for implementation. This development is also going to change the traditional manufacturing sector. Thus, the change of the industry logic needs to be integrated into strategic decisions to be competitive in the future. In this paper an approach to handle these developments in the organization's environment is addressed. The model of the ecosystem is transferred to the manufacturing industry. Based on this transfer and analysis, a roadmap for a consistent alignment of a firm in an ecosystem is suggested.

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1. Introduction and motivation

Digitization has changed B2C-relationships significantly in form of connected devices and digital networks. This is also going to affect B2B sectors in the future, since according to a study provided by MIT Technology Review the amount of connected devices will increase from 17 billion in 2014 to 28 billion in 2020. The majority of the increase will consist of connected "things", small devices that interact with each other. This may trigger a significant renewal of the traditional value chain of the manufacturing industry since digitization will offer completely new ways of value creation e.g. by offering added value by data analysis or integrating the customer via development platforms. Ecosystems of firms will evolve and create value for the customers. As a consequence firms of the manufacturing industry will have to adapt to this evolution by adjusting their strategy and business model.

This is the focus of this paper. First, the state of the art is examined and – based on this – an approach for the relationship between digitization, ecosystem, strategy and business model is suggested. Afterwards, the logic is applied to the manufacturing industry and examples for how to adapt a strategy in an ecosystem are given. In conclusion, a roadmap how to approach the position in an ecosystem for manufacturing firms is developed and future need for research is pointed out.

2. State of the art of ecosystem, business model and strategy

The following section outlines the state of the art in the field of the ecosystems, business models and strategy.

2.1. Ecosystems

Firstly, it is important to understand that the digitization brings business organization closer together. Thus, the nature and strength of interactions between those organizations gains significant importance, also because nowadays the industry structure is highly distributed among a large number of companies. According to [1] this development can be conceived similar to biological ecosystems, where the interaction between organisms is crucial to their survival because they depend on each other. [2] defines a business ecosystem “to be a dynamic structure which consists of an interconnected population of organizations.” Furthermore [3] states that an “ecosystem is at its core a plan for how the contributions in the proposed system will be modularized and what sorts of firms will provide which element”. The participants include every organization that contributes to value creation for the customer in form of products or services [1]. Ecosystems can also overlap each other, since one company can be part of more than one ecosystem. Also competitors, customers, regulatory authorities and other stakeholder who implicitly influence the processes are a part of an ecosystem [4].

This means that an organization should think not according to its value chain anymore but in ecosystems and the position the company occupies in an ecosystem. Derived from the IT-sector, [5] recognized four general types of strategies in an ecosystem depending on the turbulence of innovation and the complexity of relationships of the firm as depicted in Fig. 1.

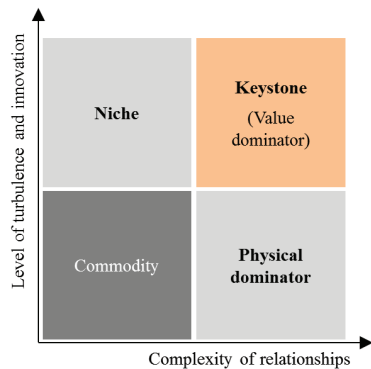


Fig. 1 Types of ecosystem strategies [5]

The keystone acts as a hub in the ecosystem since the improvement of the ecosystem health is one of his main tasks. Only a small part of the ecosystem is occupied by a keystone and it provides the tools and instruments for the ecosystem to survive also under a high level of turbulence and innovation. That means that a keystone protects the ecosystem against encroachment to ensure its survival [5]. Niches reflect the bulk of an ecosystem, but they resemble the content of what the ecosystem does and the keystone shapes the organizational aspect of what it does. From a strategic perspective, the niche player tries to specialize and differentiate himself from the other niche companies in the ecosystem [5]. In contrast to a keystone the physical dominator occupies a large part of the ecosystem and takes over other roles like niches in the

ecosystem. The value is mostly generated by the physical dominator, but since the joint value creation misses out it results in a lower level of innovation [5]. Commodity is the last role, but this reflects businesses that are competing solely via price and volume [5]. According to [5] this is no strategy a firm should be aiming at in the long term.

Apart from the strategic position in an ecosystem it is also important to consider the direct connection between different firms on a network level. The position between upstream and downstream activities plays an important role when it comes to creating competitive advantage. Challenges within upstream activities – respectively firms that deliver components for the focal firm – increase the competitive advantage of the focal firm if they can manage them. On the other hand, downstream activities which are also seen as the delivery of complements by the focal firm, do not create competitive advantage in case of challenges [6]. This can be seen as the logic between niche players, whereas keystones try to bring together the complements in order to create value for the customer. The strategy of a physical dominator in contrast would try to vertically integrate providers of complements to avoid the competitive environment that can create disadvantages. [6] points out that the business model plays a very important role in the business ecosystem setting.

2.2. Business Models

Innovations have always been an important lever for the growth and competitiveness of a company. Until a few years ago, an investment in research and development activities for creating and developing new technologies and products was considered to be adequate for operating competitively in the market [7]. In current time, however, a focus on mere product and process innovation are totally insufficient for many sectors [8]. This is where business models come into play.

Although the business model concept has been discussed in literature for several years, a commonly accepted definition has not yet evolved [9]. Relevant application contexts for this paper can be roughly clustered in two research fields: technology and innovation as well as strategy.

As representative of the research field technology and innovation, [10] use the business model to describe how to capture value from technology. Thus, they define a business model as “the heuristic logic that connects technical potential with the realization of economic value” [10]. Furthermore, a business model “performs two important functions: value creation and value capturing” [11]. [12] illustrates the advantages of open business models which help to create value by leveraging an increasing number of internal as well as external concepts. The open business model concept, therefore, allows companies to benefit of trade in intellectual property that has not yet been brought to product maturity. In relation to shorter product life cycles and associated high investment costs in innovations, an open business model could also be an opportunity to guarantee long-term competitiveness. A well designed business model can also have a supporting effect on marketing activities of innovative technologies and compensate technological weaknesses. A technology with mediocre maturity pursued by a great business model may be

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