



## COOPERATIVE INNOVATION STRATEGIES – REVIEW AND ANALYSIS

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**ABSTRACT. Background:** As the terms innovation, innovation strategy and especially cooperative innovation strategy are owned and discussed by many business disciplines, they can have various definitions. But a defined innovation strategy is the first step to enable a generation of innovation in a constant way. There are different approaches how a strategy can be defined. One common approach of an innovation strategy which includes the idea of an exploratory and cooperative strategy is the Open Innovation method. It describes three possible cooperation archetypes of an organization and its environment. Caused by the increased importance of startups and their innovation approaches a transfer of the common Open Innovation approach to a cooperation between established organization and startups is the aim of this article and results in the description of the startup orientated cooperative innovation (SOCI) strategy.

**Methods:** This article gives at first an introduction in the topic of innovation and innovation strategy and its different approaches. The Open Innovation approach is described and in a further step the transfer to the new framework of (SOCI) strategies is presented.

**Result:** As a result, the paper presents a new framework for three archetypes of SOCI-strategies. Three archetypes of SOCI-strategies were identified, by relating the three archetypes of Open Innovation to cooperations between established companies and startups. The three SOCI-strategies are: Buy/rent a startup, spin-off and startup in coupled process.

**Conclusion:** The SOCI framework can be seen as a helpful to categorized cooperations between established companies and startups in context of generation innovation and gives an overview which archetypes of startup cooperations are possible.

**Key words:** innovation, strategy, defining innovation, cooperative innovation, open innovation, startup.

### INTRODUCTION

One possible strategy for the generation of innovation is the cooperative innovation strategy. Its general approach is to open the internal corporate structures, state of knowledge and ideas of an organization to its environment. Through this opening, exchange and the transport of internal and external knowledge, the overall innovation potential and the creation of innovative products, services and organizational structures can be generated more easily [Jia, 2019]. The cooperation of established organizations and younger and smaller companies, startups, is

a common way in which the idea of a cooperative innovation strategy can be implemented successfully [He & Tian, 2018].

This paper utilizes a review of literature on innovation and innovation strategies, especially cooperative innovation strategies to achieve a clear definition for all three terms. Therefore, a number of academic journal articles and books, in total 54 sources have been analyzed and reviewed in the light of cooperative innovation strategy and Open Innovation from which 28 sources were selected by the authors of this article.

In a second step the most common implementation of a cooperative innovation strategy, the Open Innovation approach of H. W. Chesbrough is described and displayed by presenting the framework of the three archetypes of Open Innovation as defined in the research of Enkel, Gassmann and Chesbrough (2004). In a final step three startup based innovation strategies were identified and brought into relation to the framework of the three archetypes of Open Innovation. The result is the presenting of a new framework of startup oriented cooperative innovation strategy, the SOCI-strategy.

The terms innovation, innovation strategy, cooperative innovation strategy and Open Innovation are now defined in the next sections.

#### **DEFINITION: INNOVATION**

The term innovation is of Latin origin and means renovation or change. In general innovation stands for the three-step process of an idea, invention and diffusion [Fadiyah et.al., 2016]. Therefore, in a business context innovation can be conceptualized as an incidence (idea) for a product (invention) which has not been there before and which results in a high market acceptance (diffusion) [Dörr & Müller-Prothmann, 2014]. The meanings of the term innovation are of high complexity and therefore result in a large number of existing definitions. According to Haddad and Williams (2019) common and general characteristics of the term innovation exist and are defined as an implementation of change that introduces improvements [Haddad & Williams, 2019]. Gault (2018) specifies the word implementation stating that innovation is an implementation of a new or significantly improved product. A product can be a good or a service [Gault, 2018]. In summary the mentioned aspects and characteristics of the term innovation leads to the following definition applied in the context of this article: An innovation is an idea which is developed to an invention which creates change in the form of new products/services or product/service improvements, accompanied by high market diffusion.

#### **DEFINITION: INNOVATION STRATEGY**

According to Mintzberg (1987) a strategy is defined as a plan which has some sort of consciously intended course of action and can be regarded as a guideline to deal with a situation [Mintzberg, 1987]. If a company choses to generate innovation, strategically, it needs a plan according to the given corporate strategy [Ramus et. Al., 2018]. Innovation strategy is therefore defined as a set of actions fostering all procedures in an organization, including strategic goals and guidelines which have the goal to generate innovations [Goffin & Herstatt & Mitchell, 2012, Wolf et al., 2021]. According to Jia [2017] there are two main types of innovation strategies called exploratory and exploitative innovation strategy [Jia, 2017]. Both approaches are described in more detail as follows.

#### **EXPLOITATIVE INNOVATION STRATEGY**

The exploitative innovation strategy focuses on short-term successes by evolutionary or incremental improvements of existing technologies. Thus, the results are more proximate and predictable. Exploitative innovation activities are therefore making use of existing approaches, capabilities and available knowledge. In addition, exploitative innovations are more likely to look familiar to the stakeholders of an organization, lowering pushback and speeding up the adaption of the innovation thus lowering their cost of implementation [Jia, 2017]. Exploitative strategies therefore focus on incremental changes and short-term returns [Berraies, 2019].

#### **EXPLORATORY INNOVATION STRATEGY**

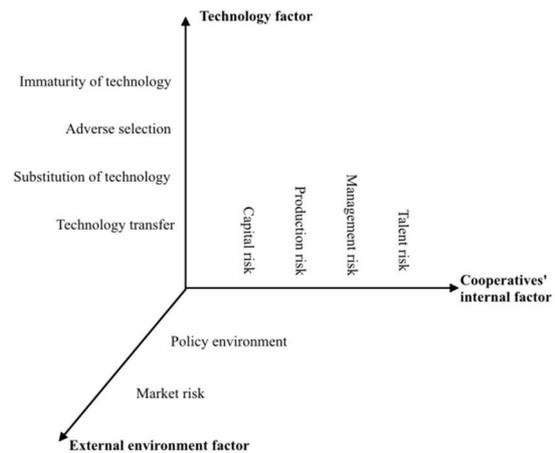
On the contrary the exploratory innovation strategy focuses on long-term success, by revolutionary or disruptive innovations. Along with this strategy comes an opportunity for potentially higher returns and at the same time an increased risk of failure [Jia, 2017].

According to Charue-Duboc et. Al. [2010] exploratory innovation has the intention to discover something that was unknown before as well as to create something new [Charue-Duboc et. Al., 2010]. These so-called breakthrough innovations are usually generated through time-consuming research and development processes. Caused by the experimenting nature of exploratory innovation strategies, this strategy could impose higher risk of failure and potentially a knowledge and information gap between the organization and its stakeholders [Jia, 2017]. For the success of an organization both innovation strategies, exploitative and exploratory, are of high importance, but resource-constrained organizations may not be able to implement both strategies at the same time. Often an organization has to decide for a singular strategic approach. If a company decides to implement an exploratory innovation strategy this is often realized through cooperation with the external environment of an organization. This results in a utilization of the exploratory strategic approach through the use of a cooperative innovation strategy [Jia, 2019].

## COOPERATIVE INNOVATION STRATEGY

The general approach of cooperative innovation strategy is to open the organization to its environment in order to include external ideas, inspiration and expertise for its own innovation process. One motivation of this strategy is to overcome limitations in resources and or a lack of know-how within the organizations [Sarpong & Teirlinck, 2017]. According to Li, Liao and Albitar [2020] there is a correlation between the application of a cooperative innovation strategy and the long-term success and value of an organization, resulting in a clear competitive advantage. Furthermore, this innovation strategy can pursuer technological innovation and profit [Zhoua, Yangb, Wangc, 2020]. The cooperative approach puts the organization in the position to discover market developments or customer needs early in the process and therefore develop more custom-fit products. As a result, an organization gains a competitive advantage in the market [Li, Liao, Albitar, 2020]. Beside the advantages of cooperative

strategies there are some risks which a cooperative behavior also includes. Luo and Hu [2015] define three main risk paradigms: Cooperatives' internal factor, Technology factor and External environment factor. Each of the three risk paradigms have several underlying risks which are display in the following figure.



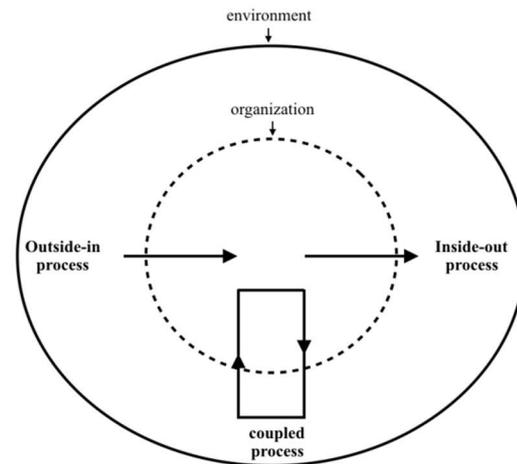
Source: Luo & Hu [2015]

Fig. 1. Main risk paradigms of cooperative innovation strategy

The first paradigm, Cooperatives' internal factor, describes the risk factor arising from innovation project's activities within the cooperatives. Cooperatives' internal factor of risk includes capital risk, production risk, management risk and talents risk. Furthermore, technology innovation is difficult and advanced with high technical barriers. Therefore, cooperatives will take more risks and uncertainty when participating in technology innovation. Technology factor of risk originates from the risk of technology immaturity, adverse selection, technology substitution and technology transform. In addition to this, External environment factors could have a negative influence on cooperative innovation caused by unpredictable changes in markets or political developments [Luo & Hu, 2015].

In spite of the potential risks of cooperative innovation strategy, He and Tian [2018] state

that cooperative innovation becomes more important and has attracted great attention from academic researchers in recent years [He & Tian, 2018]. Cooperative innovation strategies are seen to be executed in many different types, for example research joint ventures, non-equity contractual collaborations, joint projects and formal or informal arrangements and cooperation with startups [Antonoli & Marzucchi & Savona, 2016]. One popular approach is the so-called Open Innovation approach described first by H. W. Chesbrough Enkel & Gassmann & Chesbrough [2009].



Source: Gassman, O., Enkel, E. [2004]

Fig. 2. Three archetypes of Open Innovation

## OPEN INNOVATION

The Open Innovation concept provides insights into how firms can harness inflows and outflows of knowledge to improve their innovation success [Enkel & Gassmann & Chesbrough, 2009]. On this basis, Gassmann and Enkel [2004] have defined three archetypes of Open Innovation. The three archetypes of Open Innovation differentiate in their process and the way of the information streams inside or outside the organization.

- The outside-in process describes that a company opens its innovation processes to external inputs and contributions [Bogers & Chesbrough & Moedas, 2018]. The organization gets its knowledge through the integration of customer, suppliers and its general external environment [Gassman, Enkel, 2004].
- The inside-out process requires organizations to allow unused and underutilized ideas to go outside the organization for others to use in their businesses and business models [Bogers & Chesbrough & Moedas, 2018].
- The coupled process combines the characteristics of outside-in and inside-out processes. This is aimed through cooperations with complementary partners and the general environment [Gassman, Enkel, 2004].

The three archetypes are illustrated in the following figure 2.

## THE THREE ARCHETYPES OF THE SOCI FRAMEWORK

There is no existing universal definition of the term startup. In general, it can nevertheless be stated, startups are young organizations which create new products or services under market conditions of high uncertainty and which try to find a repeatable and scalable business model [Bortolini, Cortimiglia & Danilevicz, 2018]. A cooperation between an organization and external startups is nothing unusual. 262 companies out of the 500 world's biggest public companies cooperate with startups. The way this coworking is happening is of high diversity [Bonzom & Netessine, 2017]. However, it has not been tried to thoroughly analyze and classify those cooperation types, yet. Through the relating of the three archetypes of Open Innovation to a cooperation between an organization and a startup as the external input, three possible way of cooperation are possible: Buy / rent a startup, spin-off, startup in a coupled process as a mixed method. How the mentioned possible cooperations can now be integrated in the three archetypes of Open Innovation is described in the next sections.

## BUY/RENT A STARTUP AS AN OUTSIDE-IN PROCESS

Most organizations have realized that the innovation potential of startups per definition is much higher than the internal innovation potential. Thus, organizations are trying to boost their own innovation potential acquisition of a startup. For startups this is one of the so-called exit strategies where the owners of the small company sell their shares to an established organization (European Union/European Regional Development Fund, 2017). One emasculate way for this cooperation for established organization is not to buy but to rent a startup for a defined period of time. The worldwide increase of the acquisition of startups (1.217 [2011] to 4.217 [2017]) shows the relevance of the method of the outside-in process of an Open Innovation approach through a cooperation with a startup [Crunchbase, 2017; Wolf et al., 2020].

## SPIN-OFF AS AN INSIDE-OUT PROCESS

According to Davenport, Carr and Bibby [2002] a spin-off is when a company is formed through the transfer of technology from an R&D company (inside-out), which is independent of the parent company and involves the transfer of human and technological capital to a new formed market entity [Davenport, Carr & Bibby, 2002]. The innovation potential of for example the R&D unit of an established organization is used to found a new company which continues the innovation process as an quasi-autonomous entity. The smaller, more flexible and more agile structure of the new founded company aims to contribute to the innovation potential of the parent company. For example, the strategy of spin-off is often used, when an innovation has great future potential but doesn't fit in the general approach of the parent company [Wolf et al., 2020].

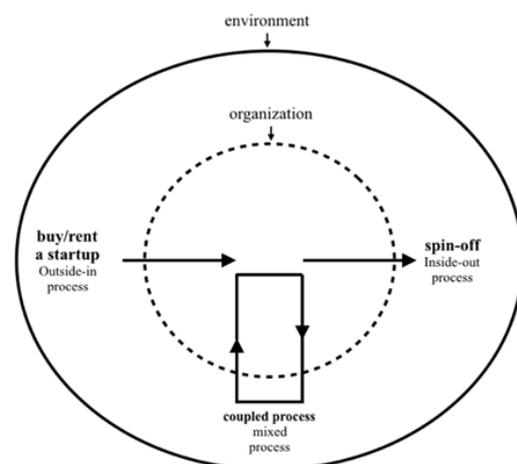
## STARTUP IN A COUPLED PROCESS

A clearly definable type of a coupled process through a cooperation with a startup is

not existing in the reviewed literature. There is no academically defined coupled process approach of a cooperation between a startup and an established company. Nevertheless, it is theoretically imaginable that such a startup-orientated cooperative innovation strategy approach, which includes the general characteristics of the third archetype of Open Innovation, can be consistently identified. Therefore, it remains as a hypothetical part of the framework [Wolf et al., 2020].

## THE THREE ARCHETYPES OF THE SOCI FRAMEWORK

The mentioned three approaches of startup orientated cooperative innovation (SOCI) strategies can be related to the framework of the three archetypes of Open Innovation. Out of this a new framework, the SOCI-framework results in which all three possible cooperation approaches between an established organization and a startup are considered. The following figure now illustrates the three archetypes of SOCI-framework in analogy to the Open Innovation framework as the final result of this paper [Wolf et al., 2020].



Source: Wolf et al [2020]

Fig. 3. Startups based cooperative innovation strategy framework

Figure 3 demonstrates the integration of the three described approaches of cooperative innovation with startups in the three archetypes of Open Innovation: Buy/rent a startup as an outside-in process, spin-off as an inside-out process and startup in coupled process. The

last process cannot be defined in one specific approach.

In general, a new framework results which intension it is to make clear which possible cooperations between organizations and startups are possible. In addition to this, the new framework helps to categorize the different cooperation approach with startup in the Open Innovation context. Caused by the orientation of the new framework on the popular Open Innovation approach, the characteristics of cooperations with startups can be understood more easily.

## CONCLUSION AND DISCUSSION

This paper introduces the definitions for the key term innovation, innovation strategy, cooperative innovation strategy and Open Innovation through the means of a literature review. In a second step, the three archetypes outside-in, inside-out and a couple process of Open Innovation are described in more detail. In this step the article describes that the general approach of Open Innovation is that organizations cooperate and interact with their external environment. One possible way of interacting with the external environment is defined as the cooperation between established organization and startups.

In a third step, three possible approaches of startup based cooperative innovation strategy which include the characteristics of the three archetypes of Open Innovation are introduced and described: Buy/rent a startup, spin-off and startup in a coupled process (undefined). Through this description it is possible to identify a gap of knowledge for the third approach. Finally, the three approaches of startup based cooperative innovation strategy are integrated into the framework of the three archetypes of Open Innovation. Through this a new framework of startup orientated cooperative innovation strategies is achieved and presented as the final result, the SOCI-framework. Based on the identification of the knowledge gap it appears reasonable to recommend further and more specified research in the area of a coupled process between established companies and startups. It thus appears reasonable to recommend more

empirical studies which describe and analyze cooperative innovation strategies in general.

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