

# Innovation and models of innovation: A brief insight into the definition and different models of innovation

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**Abstract:** Innovation has been a key element for huge successful firms in the past few decades. The fast pace at which the markets and market expectations change today requires firms to be able to come up with new ideas, products, and even manufacturing processes, which have never been seen before. Thus, innovation is one of the major elements in keeping our economy constantly growing. Throughout this paper we will present some of the basic models of innovation, starting with the definition of innovation itself. What does it mean? Where does it originate from?

**Keywords:** MODELS OF INNOVATION, LINEAR, SIMULTANEOUS-COUPLING, INTERACTIVE, NETWORK, OPEN

## 1. Introduction

*[The secret of change is to focus all of your energy, not on fighting the old, but on building the new.] Socrates*

As there are quite a few definitions, we've brought some to enlighten the core of them.

[Innovation in a broad sense involves developing new processes, new products, or new organizational improvements for the industry. It can take many forms, but in every form, it tends to reduce unit costs and/or helps to expand market demand.] (Sengputa J., 2014)

[An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process). Innovation activities include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm...] (OECD/Eurostat, 2018)

The definition of innovation is vastly defined and differs from author to author, but the basic principles that everyone agrees on are that innovation is a process needed for the firm to improve their current products, processes or services, or create new ones that haven't been known to the market. Joe Tidd et al. emphasizes in their book *Managing Innovation*, that innovation itself is of course not limited to products, multiple examples show that it can be found in services as well. (Tidd et al., 2009)

Innovation is strongly connected to Joseph Schumpeter's name and work. According to Schumpeter, innovation is defined as a new combination of production factors. He broke up with the doctrines of the neoclassic and put the disparity of the economy into perspective.

He put innovative entrepreneurs as the driving factor of economic growth. W. Rupert Maclaurin said: [Schumpeter regarded the process of innovation as central to an understanding of economic growth. The innovator as such, rather than the investor or the inventor, represented the most sensitive individual figure in the economy]. (Maclaurin W. Rupert, 1953)

His theory was built upon the realization of the importance of business cycles and their analyzation. Schumpeter talks about "creative destruction", a process in which entrepreneurs create new products/processes in the way they manufacture the products and thus generating a "monopolistic profit". (McCraw, 2007) The rivals on the market follow the new trend until the profits of the enterprise are extinguished and the market comes to an equilibrium. (Schumpeter, 1939) The cycle starts over with another entrepreneur's innovation and it goes on and on, at least that was Schumpeter's point. (Tidd Joe et al., 2005) After Schumpeter's emphasis on the importance of innovation and its effects on

economic growth more economists have started to look deeper into this field. Today it is an accepted fact, that it is not only an option, to create a competitive advantage in the market by innovations, but necessary.

## 2. Results and discussion

We can categorize innovations along with different perspectives, for example, disruptive innovation, radical innovation, incremental innovation... or another categorization would be product innovation, service innovation, process innovation, technological innovation, etc. But in this paper, I am going to focus mostly on the different kinds of innovation models that are known to us at the moment and are used by many international firms. Like in many other scientific areas the views are quite divided regarding innovation. Over the past few decades, there have been two major schools of thought, namely the market-based view and the resource-based view. The first argues, that the extent of the firm's innovation activity is facilitated or constrained by market conditions. Naturally, it is of key importance that firms can recognize such opportunities. On the other hand, the resource-based view is more focused on the firm's resources, because it argues that market-driven orientation doesn't provide a strong foundation for innovation especially in dynamic and volatile markets. It gives the firm's resources, capabilities, and skills the utmost importance. Focusing on these factors allows market participants to achieve a competitive advantage, mostly by creating new innovative products. (Trott Paul, 2017)

### 2.1. Linear Models

Linear models have dominated the industry for a good 40 years, because of their simplicity and how they made people understand the basics of how innovation takes place, in other words, how the science base (e.g. universities and industry), technological development (industry) and the needs of the market interact with each other, generating innovation.



**Fig. 1 Framework of innovation, Source: Trott Paul (2017): *Innovation Management and New Product Development*, 6th Edition, Pearson, pp. 22**

Two basic variations of the linear model for product innovation are the technology push and the market pull, as shown in the figure

below. The technology-driven model (known as technology push) assumes that scientists make unexpected discoveries, which are then applied by technologists to develop new product ideas and the rest is left for manufacturing to create a way to efficiently produce them. Then the marketing and sales department can promote the product to consumers. This model is also known as the first-generation process, the so-called Phased Review Process model, which originates from NASA. (Cooper, 1994) This model suggested, that the consumers were only passive enjoyers of the new products on the market.

After the role of the marketplace has gotten more attention regarding innovation the above-mentioned model was widespread. This new recognition led to the other linear model, the market-pull model. The essence of this model is based on close interaction with the firm and the consumers. The marketing department plays an initiator role that results in new ideas, which are then given further to R&D for design and engineering. After that, the manufacturing starts to produce new products. In today's fast-paced world, the role of the market and the customer have a very powerful and influential role to play, especially in consumer goods industries.

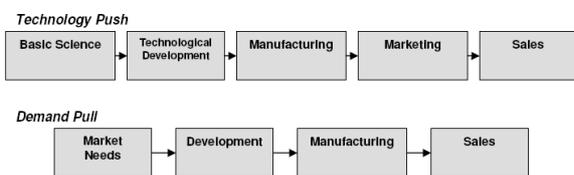


Fig. 2 Technology Push and Demand Pull, Source: Preez N.D. et al (2009). An Innovation Process Model for Improving Innovation Capability, pp3.,

### 2.2. Simultaneous-coupling model

This model differs from the previous ones in the way it takes the three functions of marketing, manufacturing, and R&D into account. This model suggests, that innovations are born from the simultaneous coupling of knowledge from all three functions. Another characteristic of this model is that the point, at which the process started is not known in advance. (Trott, 2017)

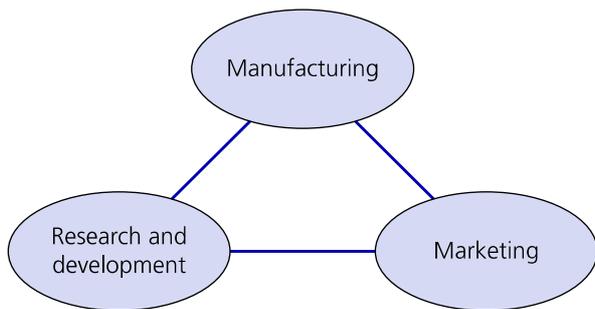


Fig. 3 Simultaneous-coupling model, Source: Trott Paul (2017): Innovation Management and New Product Development, 6th Edition, Pearson, pp. 23 Interactive model

### 2.3. Interactive Model

This model links together the technology-push and the market-pull models. It's based on the emphasis that innovation is generated on the basis of the interaction between the marketplace, the science base, and the organization's capabilities. Similarly, to the previous model, the starting point of the innovation process isn't known, therefore it gives firms much greater freedom and flexibility. The distinctive characteristic of this model is that the flow of knowledge and information mustn't be linear and continuous. As seen on the figure below the science base and the marketplace don't only

communicate with the firm's R&D and marketing department, but with the others as well. (Preez N.D et al. 2009)

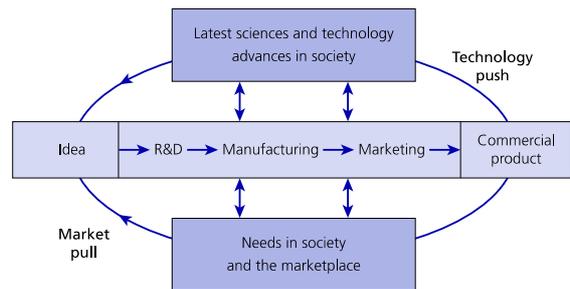


Fig. 4 Interactive model, Source: Trott Paul (2017): Innovation Management and New Product Development, 6th Edition, Pearson, pp. 25

### 2.4. Network Models

These models originated from the 1900s and were trying to let people see through the complexity of the innovation process. The basics of this model are the interactions with the firm's external environment and the communication with external players. Thus, this model suggested that there is a strong relationship between the internal and the external "stakeholders" of the firm in the innovation process. Most of the early network models were closed networks, which meant that new developments were made within the firm's boundaries.

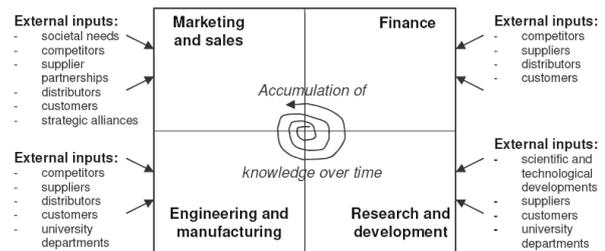
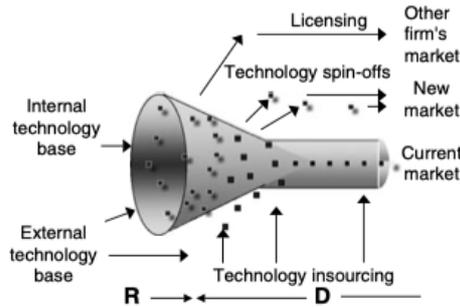


Fig. 5 Network Model, Source: Preez N.D. et al (2009). An Innovation Process Model for Improving Innovation Capability, pp7.

### 2.5. Open Innovation

Just like the previous model we are talking about network models this time too, but rather than being closed, these networks are already open ones. A huge advantage of these open innovation networks is that they have a much greater base from where the information and knowledge can stem from. [In particular, it is the use of cheap and instant information flows that places even more emphasis on the linkages and relationships of firms. It is from these linkages and the supply chain in particular that firms have to ensure that they have the capability to fully capture and utilise ideas.] (Trott, 2017)

In a closed model, new ideas can only enter one way, from the science and technology base within the firm. The ideas, projects are then filtered, some are stopped, and some are pushed through to be made a proper product for the market. On the other hand, in an open innovation model ideas and projects can come in multiple way and at multiple stages as well. Even the way the products are brought to the market can vary. (Preez N.D et al. 2009)



**Fig. 6** Open innovation, Source Chesbrough Henry et al. (2006): *Open Innovation, Researching a New Paradigm*, Oxford Press, pp. 3

### 3. Conclusion

As we've mentioned in the beginning, we are living in an ever-changing world, which creates new opportunities for companies to come up with new ideas and products almost every day. As we've seen, there have been several models which helped companies to create products and ideas that have made our lives easier and more comfortable. And like any other field, innovation is changing unstoppably. In just a few decades, several new models of innovation will be taking the place of those, that are often used today

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