

# Barriers to Product Innovations: A Theoretical Knowledge and Research Framework

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## Abstract

The essential role of product innovations for company's sustainability and growth leads researchers to explore the scientific literature and provide knowledge that helps the conduction of empirical researches on this topic. The paper brings light to the critical points of the product innovation process that can create obstacles to development of successful innovations. The main purpose of the paper is to investigate, summarize and establish an understanding of the barriers to product innovations. The paper applies "systematic literature review" as a research method to explore theoretical findings of other authors. The systematic literature review collects multiple literature sources and summarizes them to answer the defined in the paper specific research questions. Investigating the research questions, the author of the current paper introduces two groups of barriers to product innovations – general barriers and specific barriers. The paper provides an original and a new aspect of researching the barriers to product innovations. It gives new directions for investigating the barriers to product innovations – exploring the different stages of the product innovation process and seeking for obstacles within them that companies struggle with. The presented systematic literature review supports the construction of specific empirical indicators and variables, also defined in the paper, which researchers can use for conduction of studies in the field of product innovations. The paper also suggests measurement definitions and sample questions to navigate the researchers to formulate proper questionnaires that provide adequate answers.

*Keywords: barriers to product innovations, obstacles, product innovations, empirical indicators, variables, innovation studies, sample questions*

## 1. Introduction

Successful product innovations are essential for companies' long-term existence and sustainability. Product innovations help companies to improve and grow over time. The importance of product innovations leads researchers to explore the innovation literature and provide relevant knowledge to help the conduction of empirical research on this topic. The systematic study of the product innovations is a necessary step towards finding the right answers to the challenging questions in this field. The barriers to product innovations are one example of such questions that encourage researchers to take actions and explore their nature. These findings would give companies valuable insights of different obstacles that may occur in the product innovation process. The paper is a systematic review of the scientific literature related to the barriers to product innovations. Its purpose is to highlight the key barriers to product innovations in business, which present a new and original knowledge base for future research studies in this field. The innovation literature provides a broad range of barriers to innovations. The paper focuses

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on product innovations and aims to break down these barriers into two main groups – general barriers and specific barriers. The stated purpose of the paper forms the content of the particular research topic. In the process, the paper also suggests specific blocks of empirical indicators that other researchers can use to develop conceptual models for studying product innovations and collect primary data. Companies still struggle to overcome the various challenges they face in the product innovation process and carry out effective innovations. There are still critical factors that prevent companies from executing and implementing successful product innovations. Researchers have the responsible task to continue conducting theoretical research and empirical studies, analyzing the data and providing new or improved methods for developing product innovations that bring value and long-term growth. Relevant to this research problem, knowledge is a critical step towards achieving these results.

## **2. Literature review**

The theoretical review of the barriers to product innovations is one important step in constructing further research studies in this field. Barriers to product innovations in business organizations are an object of many scientific studies (Carvache-Franco et al., 2022; Jegede & Mustapha, 2022; Pellegrino, 2018; Maldonado-Guzmán et al., 2017; Pachouri & Sharma, 2016; Talegeta, 2014). The researchers' focus on these barriers outlines the importance of the research problem. In the next section, the paper aims to explore the current body of knowledge related to the barriers to product innovations and determines the key challenges that companies struggle with and try to overcome. The systematic literature review covers authors with significant influence on developing and improving the innovation knowledge and represents a method for collecting relevant secondary data that researchers could use in their innovation studies. The scientific literature in this area of study provides a broad knowledge which makes the author of the current paper to divide this knowledge into two separate groups of barriers to product innovations – general barriers and specific barriers. The general barriers to product innovations include obstacles and existing constraints related to questions that cover general factors of the organization's activities, such as the organizational resources, competency and knowledge, company mindset and environmental factors. The second group of barriers presents more specific barriers to product innovations associated with the different stages of the product innovation process. For generating the second group of barriers, the author explores the stages of the product innovation process, determines the critical steps that drive and carry out a successful product innovation process and outlines key specific barriers that could interrupt and block the smooth execution of the process.

### **2.1. General barriers to product innovations**

Companies struggle to constantly improve their innovation results. The barriers to product innovations are obstacles that negatively affect the companies' innovation activities. Robert Cooper (2011) suggests that they should start with understanding why products fail. Finding the reasons is an essential step towards gaining insights and establishing new instruments and methods for the development of successful product

innovations. The literature review section of the paper is starting with one of the most recognized authors in the field of product innovation, who is Robert Cooper. His work is dedicated mainly to improving innovation results and finding answers to the question why product innovation fails. This is the reason why the paper focuses on these particular barriers. Cooper (2011) outlines seven barriers that cause product innovations to fail to achieve the desired outcomes and company's profit goals. The barriers or "root causes for failures" (Cooper, 2011, p. 49) are a result of conducted research as well as companies' problem-detection sessions.

1. Product fails to excite customers. The product does not stand out from competitive products on the market, does not satisfy specific customer needs and preferences, and does not provide a solution to an existing problem. The product does not offer a compelling value proposition that makes the customer willing to replace the existing product with the new offering.

2. Weak front-end work. The preliminary assessment includes market research, an assessment of the product value relative to market needs, the company's technological capabilities and its requirements for success.

3. Lack of understanding customer insights. The company develops product concepts without carrying out activities to precisely define the needs and problems of the customers. Often companies do not have the necessary knowledge on how to research the market, how to properly define the main needs and problems, how to validate the product with the customer and get valuable feedback. Companies lack the experience and expertise on how to expand their customer base and engage the customer in the innovation process. There are popular concepts such as "Customer Driven Innovation", "Job to be done theory", "Outcome-Driven Innovations", "Lead user method" that confirm the customer role in the product innovation development process and the importance of understanding the market needs and preferences (Hippel, 1988; Christensen et al., 2007; Ulwick & Bettencourt, 2008).

4. Unstable product specifications and scope. Unstable product definitions and specifications are considered a major cause of slowing down the product innovation process. Such unstable specifications can be explained by various examples. Often a product starts as a specification defined by one customer, then the company decides to capitalize on this product among multiple customers, making significant changes to its scope and content in the middle of the product innovation process. In other situations, various stakeholders who influence the innovation project continue to modify it by introducing additional features and specifications, even in the final stages of the development process. There are also situations when unstable product specifications are caused by external factors outside the company, such as the emergence of a new competing product or technology or the emergence of new information.

5. Lack of cross-functional teams. The lack of cross-functional project teams is also considered a major point of failure for many product innovations.

6. Lack of focus. Companies typically have many attractive growth opportunities and limited resources. Often, the senior management chooses to pursue these multiple opportunities without being able to address the underlying issue of resource scarcity. With so many tasks, a project takes considerably longer than it should, the quality of execution

of individual activities decreases, many processes are shortened, which predetermines the unsatisfactory results at the end of the product innovation process.

7. Lack of competencies, skills and knowledge. In many business organizations, there is a shortage of specialists with the right knowledge and competencies to implement the product innovation process. There is also a lack of knowledge to access a particular market, the necessary technology or the right partnerships that can provide the missing competences and knowledge. The competency barriers to innovations is broadly discussed in the innovation literature (Andersson et al., 2009).

The literature review continues with another author, whose name is associated with the development of successful product innovations. This author is Anthony Ulwick (2016), who determines another five barriers to product innovations, which companies can face. These challenges also give a broader perception of the company's areas of obstacles.

1. Recognize that innovation is a process. Many companies still think of innovations as an art. Developing product innovation is a business process that can be measured and controlled like any other business process in the organization.

2. Executing the innovation process backwards. Product innovation is the process of developing solutions that address unmet customer needs. The aim of product innovation is to provide a solution that the market needs. Two main approaches can be identified to carry out the product innovation process: 1) Idea generation approach. In this approach, the innovation company starts the process by generating multiple ideas, followed by filtering the ideas, validating them and selecting the best ideas to develop the solution. 2) Understanding customer needs approach. In this approach, the innovation company starts by accurately understanding and defining customer needs and then moves on to develop a solution that addresses those needs. It appears that many companies use the first approach for their product innovations. They develop innovations based on the unmet needs that are unknown. The idea-based approach is proving to be unsuccessful for developing successful product innovations. Companies need to know that product innovation is a process of developing solutions. Hence, it is important that this process start with understanding and clearly defining the unsatisfied customer needs.

3. Cobbling together incompatible innovation tools and methods. Using the right instruments and methods for developing product innovations is important. Companies invest in many different tools in order to achieve predictive product innovations. They use "Design Thinking methodology", "The voice of the customer", different methods of generating ideas, building collaborations, developing open innovation. It is important for innovation companies to transform these various tools into a holistic and effective innovation development model that guides the execution of the process from start to finish.

4. Budget the time and money needed to execute the process correctly. The innovation company needs to know exactly which market segments and unsatisfied needs to target and serve. Often, companies do not initially develop the right product innovation, and then they go back to rework it; refine it in order to get it accepted by the customer. According to the author, getting an innovation right the first time is much easier than having to go back and redo it.

5. Recognize new market research methods. Companies still use standard and traditional methods to conduct marketing researches. Investing in new and different methods for

marketing researches is an important step towards gaining right customer insights and building sustainable collaborations (Ulwick, 2016).

In his book “Innovation Engine: Driving Execution for Breakthrough Results”, Jatin DeSai (2013) presents another five key barriers to product innovations, a proposal resulting from research conducted with a focus on the causes of product innovation failure.

1. Lack of mindset to collect and manage new ideas.
2. Lack of skills in recognizing and delegating the resources available in the company for the implementation of the product innovation project.
3. The presence of human capital that is unengaged in the creative capacity of the organization.
4. The organization’s focus on opportunities related to its current products, which takes the focus off discovering and pursuing new opportunities.
5. A dominant mindset in the organization that clings to the past and rejects risk taking.

Vijay Govindarajan is another author who investigates the success and failure of product innovations. He (2016) describes the company's activities in three boxes (Box 1: managing the present; Box 2: forgetting the past and Box 3: creating the future). The three boxes concept is becoming very popular, giving companies a set of tools to create successful product innovations (Figure 1).

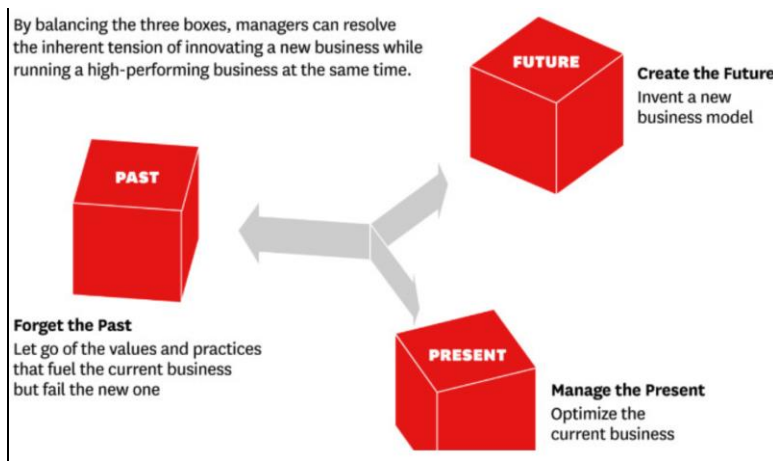


Figure 1. The Three-box solution strategy

Source: Govindarajan, V. (2016). *Three-Box Solution-Strategy-Leading-Innovation*. Boston, MA: Harvard Business School Press.

Using this concept the author (2016) talks about four key barriers to product innovations that companies should consider overcoming.

1. Barriers to competence. When companies are successful, they try to hire people who support the successes of the company related to its present activities and processes described as “Box 1”. In this way, these successes add competencies only in Box 1.

2. Companies focus on continuously improving existing products that serve the growing needs of customers on the current markets. Doing so, companies generate revenues and profits, which determine their success. Driven by success, these companies do not realize the need to change and develop something new and different.
3. Companies strongly believe that sales from Box 1 can decrease if they focus their efforts on activities in Box 3, which the author describes as the future.
4. Companies try to manage all three boxes using the same resources. There is a need to build different teams focused on the three different boxes.

The innovation literature explores the diversity and the variety of the barriers to product innovations. These obstacles or challenges that companies struggle with give a broad interpretation of the term “barriers to product innovations”. In the next section of the literature review, the author of the current paper tries to establish more specific and concise areas of barriers to product innovations.

Product innovation is not a finished product that is introduced to the market. Product innovation is a comprehensive process that accompanies the development of the new or improved product from the idea to its final implementation. Product innovation is a process of manageable steps that transform the opportunities into a value to both the market and the organization. Proceeding from this statement it is important that the paper find and examine the barriers related to the different stages of the product innovation process.

## **2.2. Specific barriers to product innovations**

Considering the separate stages of the product innovation process and the critical points of their execution, in the next section the author of the paper outlines the key phases of the product innovation process and determines the barriers that negatively influence the process outcomes in its separate stages. The author calls these barriers specific barriers to product innovations. In this section, the paper starts with the first stage of the product innovation process, which is the opportunity stage. Companies uncover opportunities for developing product innovations, which aim to bring value to the market and satisfy customer needs. The changing customer needs drive product innovations and present growth opportunities for companies to proceed.

### **A: Innovation opportunities: customer needs**

The scientific literature explores and proves the essential role of customers in the product innovations process (Wise & Hoegenhaven, 2008; Goffin, Lemke & Koners, 2010; Hippel, 1988; Ulwick, 2016; Lafley & Charan, 2008). Collaborations with customers give broad knowledge that supports product innovation. Company’s focus on customer needs results in successful product innovations. For many organizations, involving the customer in the innovation process is key to developing product innovations. Collaboration is the process of building interactions with other people or organizations to achieve a common goal. Often collaborations are difficult to achieve which lead researchers to find answers of important questions of finding new methods for building sustained interactions and collaborations with customers. To achieve a successful collaboration, it is necessary that 1) both parties clearly understand the ultimate goal of the

collaboration; 2) actively participate in the process and are motivated to work together; 3) show mutual respect and trust and 4) demonstrate a willingness to interact with each other and the ability to manage controversy. However, there are a number of barriers to building collaboration between the company and the customer. The theoretical knowledge on these barriers helps the organizations to build mechanisms to minimize or eliminate their impact. Barriers to building collaboration may exist within or outside the boundaries of the company. There are five barriers to building collaborations with customers that exist within the company (Janssen & Dankbaar, 2008; Gibbert et al., 2002). These barriers may include:

1. “We know our business better than our customers”. Many companies focus on their own product and market knowledge to develop product innovations. These companies believe they have the best resources and expertise to develop innovations. Often, such organizations suffer from an outdated mindset and fear of developing innovation outside the boundaries of the firm.
2. “Customers may steal the idea and sell it to a competing organization”. An idea is not enough to develop an innovation. This idea must be transformed into a new or improved product to be introduced to the market. This process requires hard work, specific skills and focus.
3. Lack of technological infrastructure to gather customer input. Organizations can create different channels for customers to share ideas and suggestions – call centers, help desks, online platforms, and social networks.
4. Lack of an established methodology for evaluating and selecting ideas. Good ideas and suggestions from customers can be lost if the organization does not have an established methodology for evaluating and selecting ideas. This includes delegating a team responsible for storing the ideas received, evaluating them and deciding on their implementation.
5. Errors in listening to and interpreting information received from the customer. An organization’s ability to listen to and correctly understand information received from the customer is key to developing product innovation. It is necessary for organizations to expand their knowledge regarding different modern methods and models to properly understand and define the so-called “voice of the customer”.

Barriers outside the company and related to customers may include:

1. Fear of using something new and different. Innovation means the introduction of something new or improved. Very often customers associate innovation with the need to change their lifestyle and established habits. Consumers may fear that the innovation requires them to learn to use the new or improved product. According to Ram and Sheth (1989), there are four types of risk associated with the customer adoption of an innovation. 1) Physical risk. Consumers may have the perception that the innovative product has not been used by a sufficient number of people to share their opinion. 2) Economic Risk. Consumers perceive innovation as expensive. This perception of innovation creates a perception of wasting money. 3) Functional risk. The focus is on how the innovative product works. 4) Social risk. Consumers tend not to adopt an innovation if that innovation goes against their basic principles, views, beliefs.
2. Customers feel uncomfortable sharing their ideas. Many customers feel uncomfortable when they have to contact someone to share their ideas and suggestions.

3. The customer feels that the idea will not be accepted and does not want to waste time. Many customers believe that the likelihood of an idea being accepted by the company, converted into a product or process and implemented in the market or organization is very small. These customers do not want to waste their time looking for ways to contact the company and communicate their ideas.

4. The customer does not know who to approach. There are customers who are willing to share their ideas, have the time and desire to contact the company, but cannot find information on who and where they can share their ideas.

After unlocking the opportunity for product innovations, the company starts generating ideas for developing the product concept. At this step, product innovations require creativity. The term comes to front when we talk about successful product innovations that bring value to the market and the organization. In the following two sections of the literature review, the paper continues with the creativity part in the product innovation process and the ideation process.

## **B: Creativity**

Many authors define product innovations as the channeling of creativity into the creation and the implementation of new products that people want and can buy and use. Despite defining creativity as “the most important priority of any organization in the future” (World Economic Forum, 2020), many companies still struggle to foster creativity in the working environment. This leads researchers to try to find answers in the theoretical literature, what barriers to product innovations may exist related to the creativity process. Determining these barriers could help and encourage companies to seek for instruments that can minimize and eliminate their negative impact. Many authors discuss some common barriers that prevent employees from being creative (Evans, 1993; Waltera, 2014; Castillo-Vergara, Mauricio, & Garcia-Perez-de-Lema, 2021; Mweta & Suwadi, 2021). Some of these barriers are environmental (Walter, 2012) or organizational (Mostafa & El-Masry, 2008; Serrat, 2009), others are associated with individual characteristics (Gibson, 2005). Davis (2011) divides the creativity barriers into five blocks: Learning and habits, Rules and traditions, Perceptual barriers, Cultural and Emotional barriers. The author of the current paper summarizes the different barriers in the innovation scientific literature and determines the ten key barriers to creativity:

1. Fear of experimentation. Companies fear trying new things because of failure and mistakes that could cause losses and negative results. This leads to taking safe and practical solutions to problems or tasks which are not a result of creativity and innovative thinking. Organizations need to celebrate their failures because every experiment is an attempt at something new, different and unique that keeps an organization alive and competitive.

2. Fear of rejection. Employees often experience uncertainty that their ideas will be rejected by the people involved in the decision making process. Employees do not feel free to share their ideas.

3. The environment does not accept risk. Developing something new and different is accepted to be risky and unpredictable – risk of misunderstanding customer needs and preferences, risk of developing the wrong product, risk of changes in the business environment.



4. Lack of expectation that ideas are everyone's responsibility. The achievements and failures of the organization are the responsibility of all employees in that organization. The pursuit of the different and unique is everyone's pursuit.
5. Lack of a pleasant working environment. A pleasant working environment stimulates creativity - colors, music, specific lighting, comfortable and cozy furniture, a place to talk with colleagues, games and entertainment.
6. Too much time between idea and execution. Delaying the prototyping of the innovation or delaying the actual introduction of the innovation to the market is a significant barrier to creativity. Ideas are valuable now, in this moment. If an idea brings significant improvement, novelty, utility and uniqueness to the organization and the market, that idea should move quickly to market.
7. Evaluate only the big ideas. Every idea can be a step toward something better. Even small and simple ideas can transform into significant products or processes.
8. Neglect. Neglect of idea generation and sharing by senior management in an organization. This behavior creates a reluctance and a feeling of disinterest on the part of the organization's management in employees' ideas.
9. Pursuit of the „perfect“. This barrier to creativity is associated with the organization's desire to develop the perfect product. However, it appears that the market does not desire the „perfect product“, the market wants to use a product that provides a benefit and a solution to its problems.
10. Stereotypes. Many organizations define “successful” as “productive”. These organizations see creativity as something strange and ineffective. Employees feel fear of the „successful employee stereotype“ and suppress their creativity.

Talking about creativity in the product innovation process, we can say that the most creative stage of the product innovation process is the idea generation step. This statement leads the researcher to investigate the innovation literature and understand the different barriers that exist in the ideation process. The next section presents the idea generation process and its challenges.

### **C: Idea Generation process**

Why is this process so important for developing product innovations? The idea generation is the creative process of generating new ideas and solutions using different methods in response to different challenges. This process involves generating a large number of ideas in-group discussions, selecting the best ideas, developing a plan to implement the idea, and communicating the idea to decision makers about its actual application in practice. The term “product innovation” is associated with the successful commercial exploitation of new ideas. These are ideas that bring value to the market and the organization. Thus, the goal of the idea generation process is to generate a large quantity of ideas that can then be filtered and narrowed down to the best to inspire the creation of new and improved products. Not the “right idea” is important in the idea generation process, but the generation of a large number of ideas, across the widest range of possibilities. Many authors say that the so-called “bad ideas” mobilize the development of product innovations (Godin, 2020). A significant part of the product innovations today is implementing improvements to something existing or new combinations of existing elements. In his book „A technique for producing ideas”, James Young (2003) outlines

two basic principles of the idea generation process: 1. An idea is a new combination of existing elements and 2. The introduction of old elements into new combinations depends on one's ability to connect the dots and see interrelationships between seemingly unrelated elements. The innovation literature highlights the essential role of the idea generation process for the development of product innovations (Vullings & Byttebier, 2015; Dobelli, 2013, Puccio, Mance, & Murdock, 2010). That is why defining the key barriers to the ideation process is another necessary step to contribute for the development of successful product innovations. Knowing the obstacles, companies will develop mechanisms to effectively overcome the negative impact and prevent failures in this stage. The author of the current paper summarizes the different barriers found in the scientific literature and determines the key barriers to idea generation process in product innovation development:

1. Unfavorable environment. This is the most common barrier to the idea generation process. This barrier can be related to unfriendly working atmosphere, lack of free communication, excessive workload, lack of activities stimulating creativity and free sharing of ideas.
2. Unclear objectives. The process of idea generation requires clear objectives that are understood by all involved in the idea generation process.
3. Ego and hierarchy. Good ideas rarely come from people who are inhibited by the personality or rank of others. It is necessary for people involved in the idea generation process to consider themselves equal to others in order to be able to freely express their ideas.
4. Closed mind. Often people who are convinced of the usefulness of their own ideas ignore the contributions of others. The process of generating ideas requires the participation of many different people. It uses the knowledge of multidisciplinary people who exhibit the skills to associate, connect and create new combinations. In the idea generation process, every idea is valuable. Sometimes the best ideas are inspired by the generation of many "bad and useless ideas".
5. Tendency to limit ideas. People engaged in the idea generation process stop the process after reaching a point where there are "good enough ideas" to solve the defined problem or task. One of the basic principles of the idea generation process is the large quantity of ideas. It is important that the organization delegate sufficient time to implement the idea generation process.
6. Early analysis and evaluation of ideas. In the idea generation process, ideas are expressed without criticism, distrust and a tendency to demand details. Early analysis or evaluation of ideas leads to the creation of an unfavorable environment in which people feel uncomfortable and uncertain.
7. Seriousness and lack of freedom. Many organizations are focused on statistics, logic and rationality. Thus, these organizations lose their ability to think outside the box.
8. Outdated thinking and resistance to change. Outdated thinking and fear of change are undoubtedly barriers to the process of idea generation and product innovation development in general. The business environment is becoming increasingly unpredictable. It is necessary for every organization to accept innovation development as a driver of growth and a sustainable position in the market.
9. The hammer syndrome. People have a natural tendency to tackle problems using their core knowledge and competencies. The organization makes decisions that it feels

comfortable with. These are familiar decisions, paths the organization has been down before. The process of idea generation requires people to step out of the comfort of their knowledge and skills and into the exploration of new opportunities and sources of product innovation.

10. Group thinking. The process of idea generation is a group process that involves many people. Participants create a friendly environment and relationships. As a result, they tend not to express opinions different from what is considered acceptable by the group. A collectively closed mind emerges. This behaviour is a serious obstacle to creative thinking and the free sharing of ideas.

11. Phrases rejecting ideas. The process of idea generation involves multiple and different ideas. The process requires creative thinking, the ability to associate and connect and to discover new combinations. Participants should feel comfortable to share their ideas. Thus, any rejection phrases are considered killing the ideation process.

Continuing the literature review on the product innovation process and focusing on its stages, another critical execution point of the process is determined. This is the commercialization stage. When we study product innovations, the commercialization stage is considered by many authors the most challenging phase of the product innovation process. This is the final phase of the product innovation process, which is an object of various research studies (Sløk-Madsen, Ritter, & Sornn-Friese, 2017; Cubero, Gbadegeshin, & Consolación, 2021; Datta, Reed, & Jessup, 2013; Kozludzhova, 2019; McCoy, 2008). The commercialization stage is defined as a process of the introduction of the product innovation to the market that aims to create a market desire and positive attitude towards the innovation and to generate sales for the organization (Kozludzhova, 2019). The next section of the paper gives answers to the question what kind of barriers exist in the commercialization stage of the product innovation process.

## **D: Commercialization of product innovations**

Creating value is not enough. If the market does not become aware of the existence of the innovation, the value created loses its main function, namely to satisfy customers needs and expectations. In the literature, the concept of “commercialization” of innovation is defined as a company’s attempt to generate profit through innovation by bringing the new technology developed to the market for sale”. Everett Rogers defines the commercialization of innovation as the process of turning an idea into a product that is intended for sale in the marketplace” (Rogers, 2003). The end result of commercializing the innovation is to use the innovation as a source of profit (Jordan, 2014). Commercialization can be defined as a sequence of activities that are necessary to introduce the innovative product to the market and generate revenue from its sales. The main measures of the commercialization are the degree of acceptance of the product by the market and the financial outcome of its sales (Fratini et al., 2012). Regarding the current study, it is important to define the main barriers to the commercialization process in the product innovation development. Knowledge of the possible barriers to the commercialization process of product innovations allows companies to build relevant mechanisms and actions to minimize or eliminate their impact. Many authors discuss different key barriers to product innovation commercialization (Namdarian & Naimi-Sadigh, 2018; Irani, Hayak & Asetma, 2018; Tikas, Saiyed, & Katte, 2019; Czemi-

Grzybowska & Brzeziński, 2015). The author of the current paper summarizes and determines the following key barriers to the commercialization process of product innovations. The author also suggests some actions that the innovative company should take to overcome the existing barriers.

1. Product innovation does not respond to market needs. To eliminate this barrier, the innovation company needs to have a deep focus on customer needs before and throughout the product innovation process. The company needs to be sure that the product innovation it presents to the market is the one of value that customers want to buy and use. It is important that the company seek and adapt different methods and approaches to properly understand and define customer needs and preferences.

2. Product innovation is offered to customers who do not need it. In order to eliminate this barrier it is necessary that the innovation company carry out a process of market segmentation, in order to correctly identify the customers to target with the innovation offering. The company's target markets must have a positive attitude and interest in product innovation.

3. Customers may not understand the functionalities that the product innovation offers. The innovative company should seek and apply appropriate methods to present the product innovation to the market in a way that it generates interest. The company must clearly communicate the value of the product innovation to the customers and position it as a product that satisfies their needs.

4. Lack of information about market preferences. For the purposes of commercialization of the product innovation, the company needs to have knowledge on both customer needs and preferences. The difference between the two terms emerges. By conducting marketing researches, the company aims to collect data related to different customer preferences towards product innovation. Based on the gathered information, the company is ready to develop a unique value proposition that focuses on both needs and preferences of the targeted market segments.

5. Product innovation is offered at a price that customers cannot pay. Price is considered a sensitive attribute of product innovation. Price is also the most flexible element of the marketing mix. It is important that companies define the right price that customers are willing to pay for the innovative product.

6. Inability to create interest in product innovation. Companies need to use new and modern methods to communicate the value of the product innovation to the market. They must develop unique selling propositions that are attractive, that highlight the product innovation's uniqueness, create trust and deliver promises.

7. Product innovation offers features that the customer does not need. The innovation company may offer certain functionalities and features of the product innovation that are not attractive to customers. Errors, in this case, could be related to the incorrect market segmentation, wrong value proposition or failures in properly defining customer needs and expectations at the earlier stages of the innovation process.

Depending on the customers' attitude towards the introduced to the market product innovation, Ram and Sheth (1989) distinguish two types of innovations – perceived innovations and resistance innovations. Perceived innovations do not require customers to significantly change their lifestyles, skills, knowledge, perceptions and attitudes. Resistance innovations require a change in consumer behaviour and create conflicts with

established consumer attitudes and beliefs. Consumers tend to exhibit negative attitudes towards resistance innovations and resist their adoption (Ram & Sheth, 1989). Customer resistance to innovation is caused by the existence of certain barriers that hinder the adoption of the innovation. The process of introducing the product innovation to the market aims to overcome the effect of the barriers and move the customer more quickly in the decision-making process to purchase and use the product innovation. “Resistance affects the timing of the adoption” (Ram & Sheth, 1989, p. 8).

Ram and Sheth (1989) identifies two categories of barriers to the product innovation adoption process – functional barriers and psychological barriers. Functional barriers occur when consumers perceive the innovation as a significant change in their lifestyle. Psychological barriers occur when the innovation creates conflict with customers’ internal beliefs, perceptions and attitudes. Functional barriers are divided into: usage barrier, value barrier and risk barrier. Usage barriers occur when the innovation is not compatible with the way users work, their habits, activities, the way their individual activities are carried out. Value barriers relate to the extent to which users perceive the innovation as a better solution (in terms of features and price) than existing solutions on the market. If the innovation does not provide a solution that meets the needs of users in a better way than existing products, users are reluctant to change their behaviour and decide to use the product innovation. Risk barriers are related to customers’ uncertainty about the product innovation’s ability to deliver the benefits they need. Customers delay adoption because they do not have sufficient information to eliminate risk barriers. Ram and Sheth (1989) define four types of risk that hinder product innovation adoption. 1) Physical risk. Consumers may feel that the innovative product has not been used by a sufficient number of people to share their opinions. 2) Economic risk. Customers perceive the product innovation as expensive. This perception of innovation creates a perception of wasting money. 3) Functional risk. This type of risk is similar to the physical risk, here the focus is on how the product works. 4) Social risk. Customers do not tend to adopt an innovation if it contradicts their basic principles, views and beliefs. Regarding the psychological barriers, two types are distinguished: traditional barriers and image barriers. Traditional barriers are associated with the change that product innovation brings in customers’ daily lives. Social norms and beliefs shape the traditional barriers to product innovation adoption. Image barriers are related to the association of the product innovation with a certain brand, company or technology for which customers have already built up negative attitudes and distrust. In these cases, customers do not tend to adopt the product innovation because they associate it with something negative.

Commercializing product innovations requires a good sales process. When product innovations in business are considered, it is important that the paper outline the specific barriers related to the sales process. Ron Finklestein (2015) defines selling as enriching the lives of others at great profit. The statement shapes the main purpose of product innovations – from one side to make customers’ lives better by creating value for them, and from the other side to provide value for the organizations, which value keeps them alive.

## **E: Innovation sales process**

The main goal of the product innovation commercialization in business is closing the deal and generating sales. Business organizations exist because of the value they receive in return. Proceeding from this statement, it is also for the current paper to outline the main barriers to product innovations related to the sales process.

Josh Kaufman (2020) talks about the seven major barriers to closing the deal and generating sales from product innovations.

1. Risk taking. In any closing the deal process, the customer asks questions such as What if the product doesn't meet my needs? What if the product stops working? What if I subsequently find a better offer? The seller needs to eliminate these questions and create certainty in the buyer's purchasing decision. There is a strategy that aims to shift the risk from the buyer to the sender. The strategy is called „Risk Reversal“. In this strategy, the seller agrees to assist the customer if the product does not meet his or her expectations. Thus, if the customer purchases the product and turns out to be dissatisfied with the purchase, he can return, exchange or repair it, which eliminates the risks of making an incorrect purchasing decision.

2. Persuasion resistance. Often the customers feel uncomfortable in the sales process because they think they will be pressured or misled. Customers show resistance when they feel that someone is trying to influence them and convince them of something they do not believe in.

3. It costs too much. In the sales process, customers give something of themselves (money). This puts them in a state of hesitation. Very often customers still experience this loss even after purchasing the product.

4. Product does not work in the way described. If customers think the product will not work the way it is promised and will not deliver the value described, then they will not be willing to close the deal.

5. Product does not meet my needs. Customers may think that a product is good and meets somebody else's needs but not theirs.

6. I can wait. Customers may assume that finding a solution is not something urgent and can wait.

7. It is too difficult. If the deal requires too much effort and time, the customer tends to give up.

Researching the scientific literature, the author of the current paper explores different sources and presents key barriers to product innovations. The barriers are divided into two groups with certain characteristics and areas of focus. These literature findings create a theoretical base that researchers can use and test in practice. Table 1 presents the outlined two types of barriers to product innovations, their main characteristics, area of focus and the literature sources that are reviewed in this field.

**Table 1.** Barriers to product innovations

Type of barriers	Main characteristics	Areas of cover	Authors reviewed
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General Barriers	<p>Lack of company's structure and processes to take the innovation ideas forward.</p> <p>Lack of innovative instruments to discover opportunities.</p> <p>Lack of resources.</p> <p>Lack of urgency.</p> <p>Unclear innovation process.</p> <p>Spending time on activities that do not make a market difference.</p> <p>Lack of leadership.</p> <p>Innovation Financing</p>	<p>Environment factors</p> <p>Organizational factors</p> <p>Understanding customer needs</p> <p>Company Mindset</p> <p>Competency and knowledge</p> <p>Product Barriers</p> <p>User barriers</p>	<p>Carvache-Franco et al., 2022; Pellegrino, 2018;</p> <p>Maldonado-Guzmán et al., 2017; Pachouri &amp; Sharma, 2016; Talegeta, 2014;</p> <p>Jegade and Mustapha, 2022; Cooper, 2011, Christensen et al., 2007; von Hippel, 1988; Ulwick &amp; Bettencourt, 2008; Andersson et al. 2009; Ulwick, 2016; DeSai, 2013; Govindarajan, 2016.</p>
Specific Barriers	<p>We always do it this way.</p> <p>Fear and lack of confidence.</p> <p>Lack of collaborations and interactions.</p> <p>Fear of criticism.</p> <p>Successful innovation culture.</p> <p>Innovation-centric purpose.</p> <p>Clear commercialization process.</p> <p>Proper selling techniques.</p>	<p>Innovation opportunity</p> <p>Creativity</p> <p>Idea Generation process</p> <p>Innovation commercialization</p> <p>Innovation Sales</p>	<p>Wise &amp; Hoegenhaven, 2008;</p> <p>Goffin, Lemke &amp; Koners, 2010; Hippel, 1988; Ulwick, 2016; Lafley &amp; Charan, 2008;</p> <p>Janssen, &amp; Dankbaar, 2008;</p> <p>Gibbert et al., 2002; Ram &amp; Sheth, 1989; Evans, 1993; Waltera, 2014;</p> <p>Castillo-Vergara, Mauricio and Garcia-Perez-de-Lema, 2021; Mweta and Suwadi, 2021; Walter, 2012; Mostafa &amp; El-Masry, 2008; Serrat, 2009; Gibson, 2005; Godin, 2020; Vullings &amp; Byttebier, 2015; Dobelli, 2013; Young (2003); Puccio, Mance &amp; Murdock, 2010;</p> <p>Sløk-Madsen, Ritter &amp; Sornn-Friese, 2017;</p> <p>Cubero, Gbadegeshin &amp; Consolación, 2021; Kozludzhova, 2019; Datta, Reed &amp; Jessup, 2013; McCoy, 2008; Rogers, 2003;</p> <p>Jordan, 2014; Frattini, 2012; Finklestein, 2015;</p> <p>Irani, Hayak &amp; Asetma, 2018; Namdarian &amp; Naimi-Sadigh, 2018; Tikas, Saiyed &amp; Katte, 2019; Czemiell-Grzybowska &amp; Brzeziński, 2015; Kaufman, 2020.</p>

**Source:** *Compiled by the author.*

### 3. Methodology/Research methods

The author of the current paper applies “systematic literature review” as a research method to examine data and findings of other authors. The systematic literature review starts with identifying the research topic, followed by discovering the research sources, collecting the existing data, summarizing the main literature insights and developing specific empirical indicators, measurement definitions and suitable measurement scales to help the study of product innovation barriers. The innovation literature that covers the research topic is very broad and complex. This is the reason why the author of the current paper decides to divide barriers to product innovations into two groups. The first group presents the general barriers to product innovations that cover obstacles and constraints related to questions that cover general factors for company’s success such as organizational resources, competency and knowledge, company mindset and environmental factors. The second group of barriers presents more specific barriers to product innovations associated with the different stages of the innovation process. For generating the second group of barriers, the author explores the stages of the product innovation process and the critical steps that drive and carry out a successful product innovation process. Product innovations are a necessary part of the company’s business activities. It is important that companies know what barriers exist in order to build strong mechanisms to overcome them. The research problem of the paper focuses on the obstacles called barriers to product innovations that companies should monitor and feel confident to minimize or eliminate. Four research questions are objects of investigation of the scientific literature on this topic. These are the questions that the literature study aims to answer:

Q1: What barriers to product innovations exist in the scientific literature?

Q2: What are the key barriers to product innovations?

Q3: What are the empirical indicators and variables the researchers can use for conducting studies in this particular area?

Q4: What questions could be formulated to help the conduction of empirical studies?

When searching for relevant data, the author uses keywords “barriers to product innovations’ ’; “obstacles and constraints to product innovation”; “product innovation failures”. The paper explores scientific articles, books and other sources relevant to the particular area of research. The systematic literature review aims to provide a more complete understanding of the nature of the product innovation barriers and covers journals and books published between and . The cited authors are well distinguished and known in the research field. The paper uses exploratory research, which aims to gain insights and understanding of the research topic. It focuses on the discovery of different thoughts related to the term “barriers to product innovations”. The exploratory research will help the conduction of a descriptive research that will further explain and validate the theoretical findings. Based on the literature review and the author’s findings, there are specific empirical indicators and measurement definitions developed in the paper that can be tested when conducting future innovation studies (Table 2).

**Table 2.** Empirical Indicators for studying the barriers to product innovations

Conceptual terms	Blocks of empirical indicators	Measurement definitions
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General Barriers	Problems in product specifications and scope. Uncertainty in the innovation process. Problems in competency and knowledge. Inadequacies in organizational structure and mindset. Insufficient internal resources. Problems in using effective methods and innovation models.	To investigate the defined barriers to product innovations in the organizations. To explore the degree of strength of the defined barriers to product innovations. To understand which barriers to product innovations are overcome or still an obstacle.
Specific Barriers	Problem in building collaborations with customers and innovation partners. Difficulties of understanding customer needs. Problems in fostering creativity and idea generation. Difficulties in the commercialization process. Problems in the innovation sales process. Uncertain selling techniques.	To investigate the relationship between the defined barriers to product innovations and their failures. To examine the applicability of the defined barriers to product innovations in the specific industry. To use the defined barriers to product innovations as an instrument for developing new models for executing successful product innovation process.

*Source: Compiled by the author.*

#### 4. Results and Discussion

The finding section in the paper describes what the researcher finds when collecting and analyzing the relevant to the research topic data. After conducting the systematic literature review, the author of the current paper summarizes the innovation literature sources and suggests two groups of barriers to product innovations – general barriers and specific barriers. The defined groups provide a new and original theoretical knowledge base to help the conduction of future research studies in this area of product innovations. The paper finds the answers to the defined in the methodological part four research questions. The systematic literature review leads to the construction of a research framework to navigate further investigations on the topic and the collection of primary data. The paper presents specific blocks of empirical indicators, which describe what is essential for the researchers to explore when studying the barriers to product innovations. The paper also identifies six measurement definitions that give a meaning to the investigated concept and a more narrow focus. Research variables and attributes are also identified to lead the author of the paper and other researchers in their following research work. Apart from this, the paper provides sample questions and measurement scales as part of a questionnaire to investigate the barriers to product innovations (Table 3). The

questionnaire makes it possible for the researcher to obtain primary data and test the theoretical findings.

**Table 3.** Variables and attributes for studying the barriers to product innovations

Variables	Attributes	Sample questions	Measurement scale
Product	scope and specifications customer feedback building proper product concept providing solution competitive advantage	For your successful product innovations, how important for your company is to overcome the following barriers? <ul style="list-style-type: none"> <li>• Lack of product scope and specifications.</li> <li>• Unclear product concept.</li> <li>• Product does not provide a solution to existing problems.</li> <li>• Product does not have a competitive advantage.</li> <li>• Ineffective customer feedback</li> </ul>	Scale of importance (very important, important, neither important or unimportant, unimportant, very unimportant)
Innovation process	weak front-end work understanding customer needs cross-functional teams innovation process focus	To what extent do you agree with the negative impact of the mentioned below barriers to your product innovations? <ul style="list-style-type: none"> <li>• Weak front-end work</li> <li>• Poor understanding of customer needs</li> <li>• Lack of cross-functional teams.</li> <li>• Lack of an overall product innovation focus.</li> </ul>	Likert Scale (Absolutely agree, Agree, Neither agree or disagree, Disagree, Absolutely disagree)
Knowledge and competency	inadequate innovation tools and models marketing researches resources allocation company's strength. points uncovering and prioritizing innovation opportunities	Which of the mentioned barriers do you consider most significant to your product innovations?	Multiple choice question with more than one answer
Company mindset	risk-taking focus on past activities focus on existing products closed mind resistance to change	To what extent do you agree with the statement "Lack of company's innovation mindset is a key barrier to product innovations"?	Likert Scale (Absolutely agree, Agree, Neither agree or disagree, Disagree, Absolutely disagree)
Innovation opportunity	customer needs as opportunity	Considering the innovation opportunities, rank the following barriers from 1 – most	Rank scale (from 1 to 5)

	understanding customer needs knowledge instruments infrastructure collaborations and interactions prioritizing innovation opportunity	difficult to overcome to 5 – least difficult to overcome. and • Understanding customer needs. • Lack of adequate knowledge to uncover innovation opportunities. and • Problems in conducting marketing research. • Building collaborations with customers. • Difficulties in prioritizing the innovation opportunities.	
Creativity	innovation environment rejection stereotypes lack of freedom group thinking	How important is overcoming the creativity barriers to your successful product innovations?	Scale of importance (very important, important, neither important or unimportant, unimportant, very unimportant)
Idea Generation process	unclear objectives ego and hierarchy bad ideas hammer syndrome ideas limitation early idea evaluation	To what extent is the successful idea generation process related to the company's ability to overcome the mentioned below barriers? • Unclear objectives. • Ego and hierarchy. • Idea limitation. • Early idea evaluation.	Rating Scale (to a very large extent, to large extent, neither large or little, to little extent, to very little extent)
Innovation commercialization	response customer needs customer preferences innovation functionalities innovation price market interest and positive attitude functional barriers psychological barriers	To what extent is the successful innovation commercialization related to the company's ability to overcome the mentioned below barriers? • Product innovation does not respond to customer needs. • Product innovation cannot create market interest and positive attitude. • Product innovation has a price that customers cannot pay. • Product innovation does not satisfy customer preferences.	Rating Scale (to a very large extent, to large extent, neither large or little, to little extent, to very little extent)
Innovation Sales	buyer risk persuasion resistance innovation cost value proposition	Rate the mentioned below barriers related to the innovation sales process. • Risk taking. • Persuasion resistance. • Product does not work as described. • It is very expensive. • The purchase is not urgent. • The process is too difficult.	Semantic differential (Difficult to overcome – Easy to overcome)

**Source:** *Compiled by the author.*

## 5. Conclusion

The aim of the paper is to gain understanding and insights of existing literature knowledge related to the particular area of investigation, which are the barriers to product innovations. It explores the scientific literature, summarizes it and provides a knowledge base and a research framework for further innovation studies. The investigated body of knowledge answers the main objective of the paper, which is to outline the barriers of product innovations that create obstacles to the successful execution of the innovation process. Moreover, the theoretical contribution of the paper lies in the author's classification of the barriers into two primary groups, accompanied by their respective subgroups. The author's contribution in categorizing the barriers to product innovations into groups and subgroups significantly enhances the research studies in this area, making them more effective and time-efficient. This classification approach also provides a more precise focus on the research problem related to the barriers of product innovations. By dividing and studying these barriers, the researchers gain a deeper understanding of their nature and impact on company's innovation activities. The defined barriers underline one side of the reason why product innovations often fail, which can effectively navigate the way companies develop specific strategies to overcome these obstacles and develop successful product innovations.

Based on the gained theoretical knowledge the author also presents specific blocks of empirical indicators, variables and attributes to help the conduction of research studies in this field, which answers another main objective of the current paper. The developed research framework supports other researchers to continue seeking for answers to solve the research problem using primary data. By providing measurement definitions and sample questions, the paper offers a practical guidance to navigate the process of designing effective questionnaires for the purposes of the conduction of surveys. The practical contribution of the paper lies in offering clear guidelines and examples that help researchers to formulate questions that gather proper and meaningful information, leading to accurate answers. However, the barriers to product innovations are just one part of a broader research problem related to the question "Why do product innovations fail?". Literature reviews could also focus on other essential sides of the product innovation theory. These other sides may cover different areas of research, associated with: customer needs as a source of product innovations; understanding customer needs for developing successful product innovations; customer role in the innovation process; collaborations with customers. The investigation of customer needs and their role in the innovation process is crucial for the development of successful product innovations. Exploring different customer-centered theories can provide valuable insights to guide companies' innovation strategies. Other aspects that need to be addressed are related to the different forms of product innovations that bring value to the market; building innovation strategies for growth and sustainability and improving the innovation commercialization process. The main limitation of the theoretical knowledge and the developed research framework is related to the lack of empirical evidences. The literature review provides a sustainable knowledge, which is one important step to the conduction of an empirical study. However, without empirical studies that investigate the barriers to product innovation in specific industries, the findings may lack applicability. Indeed, the paper encourages other

researchers and the author to address the limitations and gather empirical evidence that enhances the understanding of the barriers to product innovations in business and support or challenge the theoretical knowledge.

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