

Process to Determine Innovation Types Within Organizations

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Abstract: Innovation is a highly-used term today which can be found in almost all branches of economy. Therefore, most organizations are developing innovation strategies to increase performance and boost profits. Especially in bigger companies it pays off to have a closer look at the individual organizational elements to see if one single innovation strategy fits for all those departments, teams and units. Dr. Jens-Uwe Meyer discovered that there are different innovation types that can and should be used to meet the organization's and employees' needs for innovation. The aim of this work is to construct a process that identifies the innovation type of a single organizational unit, based on the researched innovation types. These innovation types are: proactive innovator, strategic innovator, innovative optimizer, operative innovator. The developed process will guide users step by step through the tasks to find the appropriate innovation type to follow.

Keywords: innovation, management, innovation types, process, single organizational unit.

INTRODUCTION

In today's world, it is becoming increasingly necessary for companies not only to orientate themselves on the pure sales profit of their products, but also to examine future developments in very detail. As a result, the concept of innovation quickly is quickly adopted. Based on previous experience, many companies have already established process-focused innovation models and use them successfully[1].

Due to the ever faster development, especially in the technological field, these models are already reaching their limits. However, this does not mean that these innovation models are completely outdated. Rather, these short cycles, especially in the field of information technology, more and more demand new or alternative innovation methods. It is not easy for technological companies, especially if they have been on the market for a long time, to choose the appropriate method and establish it in their own organization. At the same time, the current trend towards digitalization is becoming increasingly important, since established companies are now confronted with issues that cannot be directly attributed to the actual operative business[1,2].

As a result, more and more innovation models and processes have been established in recent years. On the basis of selected examples, the implementation of these models and processes, the quality of the applied methods was assessed. The focus was rather limited on the determination of the presented methods. A basic statement of some investigations is that there is no overall statement about a generically correct innovation method, its processes or strategy, due

to the fact that several departments are working on different topics. In product development, it is advantageous to pursue an incremental innovation process that involves a steady improvement of the product or service but does not encourage revolutionary new products or services during implementation, where in a spin-off department it can be very useful to follow a different path here. These two separate streams can differ tremendously, the strengths of these individual methods lies exactly within the differences. A company that is largely engaged in incremental innovation is very likely to be an innovative optimizer. In this case, an optimization of established processes would increase the speed of innovation. However, this is just one example of one of several types of innovation. A fundamental statement of the literature considered so far is that it is not sufficient to establish a single innovation strategy and unify it uniformly throughout the entire company. This could lead to only incremental innovation, putting a very strong focus on the mere further development and improvement of existing products and services. As a result, rather no new products and services are developed and the company runs the risk of losing connection to the market[3].

It is recommended by some experts whose work is used in this paper to explain that it is necessary to determine the requirements of a company by looking at the individual organizational units[1]. This makes it possible to determine very precisely which type of innovation corresponds to an organizational unit and which innovation methods, be they incremental or more radical in nature, have appeared most suitable for achieving the company's innovation goals.

INNOVATION

According to Schumpeter, innovation is a process that leads to a new production function. In addition, he has defined five specific processes that lead to exactly this result. They can be named as: the introduction of a new product; the introduction of a new method of production, the development of a new market, making available a new source of raw materials and the introduction of a new enterprise in the industry. Each of these five processes is seen as an innovation [4].

In general, two types of innovation are distinguished in the literature: incremental innovation and radical innovation[4,5], which are presented below.

Incremental Innovation

In general, this form of innovation occurs within a company, allowing it to gradually adjust to the changes that innovation brings. Often, this type of innovation leads to an increase in effectiveness and productivity in a particular process or part of the business. As an example, agriculture can be cited here. Improving harvesters will increase the productivity of the work and reduce the cost of a harvested unit. The yield and the resistance of the harvest itself could be increased. This type of innovation usually does not happen leaps and bounds over time. For a company, this kind of innovation is a necessity to be able to constantly evolve in the existing and developed market and to remain competitive. Sooner or later, companies that tighten themselves to this continuous process will be overtaken by their competitors, where they can offer more cost-effective solutions and thus gain more market share. This leads to losses in the own enterprise and in the worst case to a withdrawal from the market. For this reason, incremental innovations are actually present in all areas and markets, and are mostly lived as normal processes integrated within the company[4].

Radical Innovation

In contrary to incremental ones, radical innovations do not emerge from existing processes, but can very well represent a continuation of an incrementally initiated innovation. This type of innovation is generally characterized by the fact that it can have a very large impact on one or even several sectors of the industry. They very often represent major breakthroughs, creating new markets, changing existing

forms of production and even overtaking some industries and leading to their extinction. A well-known example of a radical innovation is the development and mass production of the computer. This is a radical innovation from an incremental innovation, as the improvement of transistors to digital circuits has been an incremental innovation that has ultimately allowed computers to spread so much that they became available in every household. The impact of this innovation has been evident not only for the computer industry in terms of increasing sales, but also through the introduction of new application areas for the user himself. From the introduction of diagnostic programs to personalized advertising, nothing would have been possible without the introduction of powerful and affordable computers[4].

Once the distinction between the two types of innovation has been made, it is important not just to pursue one of the two ways, but to combine the characteristics and purpose of both. It's critical for a business to make incremental changes to their products and services in order to remain competitive. This is exactly what leads to standardized products and production processes and methods. Once these processes have been established, another goal of the company must be to radically innovate these processes and products and to make them redundant. This bridges the gap between incremental innovation and radical innovation within a company[4].

SOURCES OF INNOVATION

Innovation is seen by Peter Drucker [6] as one of the most important functions of an entrepreneur. The term entrepreneur is used in different contexts. In some cases it refers to the size of a company and in other cases alludes to the short existence of start-up companies. But regardless of these definitions, they all have one thing in common and that is the innovation that is central to the activities of these companies. These activities should lead to the introduction of new products or services or contribute to the improvement of existing ones. This can be done through the use of new technologies or through the improved use of resources. The area in which these companies operate plays a subordinate role, as these approaches can be found in both public companies and in the private sector down to the sole proprietorship.

In some cases, of course, an innovation can come from a spontaneous or ingenious idea and become a success. Most of the time, however, such further development or a new business field comes from active observation and targeted search for the next opportunity to develop an innovative idea. These opportunities can be found both inside and outside the company. Subsequently, the most common sources of such opportunities are identified, from which innovations are

most often developed. Four sources are worth discussing coming from inside an organization[6].

The Unexpected: Often, unexpected success or failure in a business are ignored or perceived as not particularly important because they do not meet current expectations. But these unexpected events can lead to much greater success and opportunities. As an example, the development and synthesis of novocaine can be cited here. German scientists designed the first non-addictive narcotic in 1906. The aim of this invention was to use this medicine for all major operations. This goal was not achieved because general anesthesia was used and is still preferred today. However, another profession was paying attention to it, the dentists. They found the product very suitable for their purposes and started to use it. However, the actual developer spent a lot of time explaining to the dentists that his product was not intended for this application. From this example, it is very clear that the unexpected can also be used to derive a new development and opportunity, if one looks at the opportunities and not just concentrates on the failure.

Incongruities: Here, ideas and technologies are brought together which at first glance have little or nothing to do with each other. By combining these different elements, however, an improvement or even a redefinition of a product or service is achieved. As an example, the cargo ship industry can be used here. Shipyards and freighters have been working for a very long time, over 50 years, exclusively to improve their ships in terms of fuel consumption and speed to cut costs and stay competitive. Nevertheless, this industry around 1950 was almost forgotten. Only by recognizing that the previous assumptions were wrong and not the actual time at sea and the fuel consumption were the biggest cost drivers but the time in which the ships were in port and could not be used led to new considerations. These considerations brought an already used technology into play. Thus, the ships were extended with containers or the possibility to drive directly to the ships and from the ships. This technique had long been used on trains and trucks at the time and helped ship transport back to a very strong upswing[6].

Process needs: Another source of innovation is the need to replace an existing process or drastically improve it. This compulsion may well create creative ideas to solve an existing or foreseeable problem. As an example, the development of the automated switchboard for the telecommunications industry can be seen here. This development took place on the basis of a statistical forecast, from the year 1909 of the American Telephone & Telegraph Company. This forecast predicted that by 1920, every American woman would be needed to work on a manual control panel to enable the needed telephone connections. Because of this prediction, AT&T developed a completely

automatic product within just two years and began to install it[7].

Changes in the industry or the market: The well-known markets and also the industry do not change constantly and certainly not often in a big way. However, as soon as such a change announces itself or simply happens suddenly, this change represents a tremendous opportunity for innovation. New markets are rapidly developing or new technologies and perspectives are overlooked or simply ignored due to the reason that they are not following known paths. The risk is as high as the opportunity is for existing companies, as new startups can be founded quickly and, by not taking opportunities from the established companies, they can apply these new models and markets for a relatively long time without interference. Additionally, three more sources are worth discussing coming from outside an organization[6].

Demographic changes: Of all the sources of innovation that can be found outside an organization, the demographic evolution of the population is one of the most reliable. This factor has long been known in the management levels of companies, but it is often underestimated with the belief that this development is slow and there is still enough time to respond later. Japan is one of the leading forces in robotics it has early identified and responded to demographic change. It was recognized in the 1970s that it would be a very fertile period, but at the same time there was a sharp increase in education. As a result, a bottleneck in the available number of workers for traditional manufacturing industry was predicted for the 1990s. In response to this new reality, Japan began to develop new methods and technologies to compensate this bottleneck. As a result, Japan now has a clear lead in robotics.

Changes in perception, mood or understanding: The typical example of a change in perception is the famous phrase "The glass is half empty" or "The glass is half full". It is important, above all, that here the facts did not change but only the interpretation and attitude related to it. It is precisely this shift in attitudes about facts and developments that can yield a considerable amount of new input for innovation. For example, in the 1980s, life expectancy in all areas of the US has increased significantly, and at the same time the focus on health and fitness has risen in the population. As a result, the fear of illness has also risen significantly, as many things have suddenly been identified as the cause of illness. This change in the attitude of the public to health also led to the creation of a completely new market for magazines and journals dedicated exclusively to this topic[6].

New knowledge: This source of innovation is the best known, and also the one most often meant when talking about innovation. At the same time,

however, it is also the most protracted because of the theoretical possibility of doing something and the market launches of a product based on this knowledge are often a long way off. In most cases, this is due to the fact that a single insight alone is not enough to bring a product to marketability. In many cases, it is a combination of several technologies and insights that together make up the finished product.

In addition to the sources of innovation mentioned above, employees in a company remain the most important resource, according to Paul Cook. Without the input of one's own employees, innovation would not take place within a company. From them, new ideas are introduced and presented and suggestions for improvement are developed[8].

"To be effective, an innovation has to be simple and has to be focused. It should only do one thing; otherwise it confuses people"[6] This is to say that regardless of the source of an innovation, the focus and the goal must be in the foreground. Therefore, in an innovative company, the goal is not necessarily to have all the sources of innovation in mind, but to think about which sources are most relevant to your own area. Of course, the focus of the sources may change over time and finding out is the job of good management.

INNOVATION MANAGEMENT

The term innovation management encompasses two terms that require to be defined in this context. The first part is innovation and the second part is management. Since the concept of innovation has already been dealt with in previous parts of this paper, special attention is now given to the notion of management. Here are two basic areas to distinguish. The first area is the area of the institution. This means the organizational structure of the company, which is represented by certain persons. Thus, the formal organizational delineation of responsibilities and tasks is regulated. The second area is the function. The role of the function in this area is to define strategies and goals, to make decisions and to direct information flows. In addition, social relations should be established and partners must be driven to realize the decisions taken[9].

Innovation management can also be summarized as the collection of ideas for the further development of new products and services and their development, implementation and market introduction[10]. Both interpretations of innovation management have in common that they are about the framework conditions that have to be created for innovation to take place. This can include both the collection of ideas and development of strategies for the market launch of a product, as well as the structure of the associated organization within a company. One of the most important aspects of this is the definition of a

strategy. The following chapter deals with exactly this definition.

Innovation strategies follow the same guidelines and objectives as any other business strategy. This means that a strategy is to set up the available resources of a company according to the available opportunities and risks. This approach reveals that a corporate strategy is a pattern of decisions within the company which has been taken to achieve this goal[11]. To do so, two steps are essential in a company. The first step is to formulate the strategy and the second step is to implement this defined strategy. When formulating the strategy, decisions on which direction the company wants to move and what exactly those goals are. During implementation, all the necessary steps are taken inside and outside the organization[11]. In order to really reach this goal, it is necessary for a company to be aware of its market positioning and of its own potential. This also includes the range of innovation types described in the following lines, so that the right decisions and strategies can be derived on the basis of this information and insights for the whole enterprise[12].

Types of Innovation

In this work, the types of innovation according to Dr. Jens-Uwe Meyer are described. By interviewing around 200 managers in the field of innovation, the following four types of innovation were derived from the data obtained, using a factor analysis[1]: proactive innovators, strategic innovators, innovative optimizers, operational innovators.

Proactive Innovators: The proactive innovators focus on the company's strategy. This attitude and alignment is also communicated to the employees on a very large scale. The goals announced in this way also provide an evaluation basis for the employees. This should also provide staff with the necessary resources to ensure that the required enthusiasm and perseverance in innovation projects can be worked on. The culture of mistakes in such an environment is also particularly pronounced, since positively completed innovation projects also have a positive effect on the individual. Mistakes, on the other hand, are seen as part of the creative process in this environment and so accepted. This of course also tries to learn from mistakes. In the absence of expertise, the willingness of the management is very large and the integration of external resources to make it possible to make the appropriate know-how available in the company. The working environment is characterized by the promotion of creative ideas. In particular, the processing and the introduction of these ideas are kept as simple and non-bureaucratic. Also, the focus at work is not only on the mere execution of tasks, but also very much on the establishment of networks and the exchange beyond the boundaries of the individual areas.

In summary, the proactive innovator can be seen as holistically focused on innovation. Here, the creative potential of the employees is promoted and used, creating an environment in which there are no barriers to the implementation of creative, innovative and new ideas. At the level of management, this is made possible by strong communication in particular with regard to the strategy of the organization and the creation of suitable framework conditions. This makes the implementation of radical innovations much easier and the associated risks are accepted and treated[1].

Strategic Innovators: As a strategic innovator, innovation is one of the organization's key drivers, but daily business is very much driven by operational agendas. There is a clear strategy for the organization and it is also given and supported by the management. Unlike a proactive innovator, however, innovative ideas coming from management have a much higher chance of being implemented than suggestions from employees. This also means that fewer ideas come from the employees and that the culture of error is not so strongly oriented towards innovation as with a proactive innovator. The implementation of innovations, here more in teams, that have been specifically set up for this task and in the selected composition to pursue and implement a specific goal. Again, there is a difference to a proactive innovator, as additional resources are only approved to a very limited extent. The organizational structure in this case is also much more hierarchical and less permeable to new ideas and impulses than to a proactive innovator. It is difficult, if not impossible, to circumvent existing structures[1].

Innovative Optimizer: An innovative optimizer does not reflect a very strong focus on innovation across all existing management levels. There is a clear objective and also a definition of a strategy, but rather weak and focused on the executives themselves. These are required to develop and promote creative and novel ideas. Unfortunately this is expected, but the willingness to provide additional resources here is rather low. There are also incentives for the creative process, but to a lesser extent than for a proactive innovator. By installing suitable processes for new ideas and using an "idea manager", we try to identify new ideas and select those with the least risk and put them into practice. Here the operative agendas are very strongly determining for the daily business of the employees. However, innovation can be found in this type of innovation, as it places a very strong focus on improving and refining existing products and services. Due to the strong influence of the operational activities, the risk appetite is rather low. Really radical innovations do occur in this environment but are not the largest group of innovation topics. Here, innovation takes place along a defined process, the functioning of

which is convincing to the management and therefore offers little additional support apart from this. The great strength of this type of innovation is that it allows existing and established processes in the enterprise to evolve products and services over a long period of time, through incremental innovation. Thus, a longevity and a very high quality can be achieved for precisely these products and services. Thanks to the strong focus on quality and safety in the further developments, significantly fewer rash steps are taken. The disadvantage of this innovation type, however, is that through this strong rule-orientation, a slow approach to innovation is established[1].

Operative Innovator: Unlike innovative optimization, there is no noteworthy strategic focus on innovation in the business of an operational innovator. Any goals hardly play a role in the daily work. This does not mean that there is no innovation in this type of innovation, but management support is almost completely lacking. Radical innovation is seen as a burden rather than a new opportunity. That is why almost exclusively incremental innovations take place here. Even these are more likely to emanate from the employees themselves than from the executives.

The establishment of very rigid processes and precise regulations are not particularly conducive to innovation. When handling the mostly incremental innovations, the employees are very dependent on themselves. Although the executives do not prevent the further developments, they are also not very supportive. Especially the points of external knowledge and the provision of further resources are not lived or are very difficult and can only be obtained through lengthy processes[1].

RESULTS

This chapter describes the exact process of determining the type of innovation of an organizational unit. This process is general and applicable to any organizational unit. Ideally, this process is applied to the smallest possible unit in an organization. Normally this is the unit that is located directly below the department. This ensures that possible different areas of responsibility can be considered and evaluated in the analysis. There are several units within one department and the units have different requirements for innovation and also different framework conditions, which has resulted in a different type of innovation for the individual units in the evaluation.

In the following, the individual process steps are briefly described.

Determine organizational unit

In the first step, it is necessary to deal with the organizational unit to be investigated in order to determine in which granularity the survey should take

place. It is recommended to choose the smallest possible size of the organizational unit, so that possible differences in the types of innovation can really be worked out.

Select interviewee

As already mentioned in this chapter, the selection of the right interview partners is a decisive step. Executives in the respective areas have proven to be most effective for the survey since this is where a holistic perspective can best be represented[1]. The selected interviewees should be informed in advance about the purpose of the interview and it should also be pointed out that this is not a question of knowledge, but an assessment based on their experience of the current situation in their field.

Adapt interview guide

The existing interview guideline and the guideline questions contained therein should be revised before the interviews are carried out, so that it can also be ensured that all identified categories are queried. The categories are particularly important to allow assignment of the appropriate type of innovation. After the revision, it is advisable to submit an overview of the categories to the selected interviewees in order to facilitate an ideal preparation for the appointment.

Perform interviews

The interviews should be conducted in a quiet setting as they must also be recorded for later

transcription. The conversational partner should be informed separately about this point. It must also be emphasized that these interviews are treated confidentially and that the transcripts are used purely to determine the current situation, are not passed on, and are only available for this survey.

Evaluate interviews

For this process step the transcripts of the interviews are used. Here, first the transcripts are worked through individually and the statements are paraphrased and abstracted. Then these paraphrases are assigned to the individual categories. This assignment is necessary in order to determine the type of innovation in the next step by evaluating the statements with the help of the context.

Determine the type of innovation

The statements associated with the categories must now be evaluated on the basis of the definition of the individual types of innovation. It is possible to proceed according to the categories already known, since the characteristics of the framework within the categories differ in each type of innovation. Thanks to these differences, it is possible to assign the characteristics to the appropriate innovation type. The type of innovation that has the most equivalents in the evaluation can be seen as the predominant innovation type of this organizational unit. The following table can be used for this.

	Proactive innovator	Strategic innovator	Innovative optimizer	Operative innovator
Strategy				
Leadership style				
Communication				
Context				
Type of Innovation				

Determine requirements for innovation

From the interviews, the general direction of the requirements of an organizational unit can be derived from innovation. Particular attention should be paid to the nature of the innovation, since the expression of expectations in this area can often be very decisive. For example, an operational innovator can expect incremental innovation, with a proactive one certainly a large part of the expectations in the direction of radical innovations[1].

Compare requirements with the innovation type

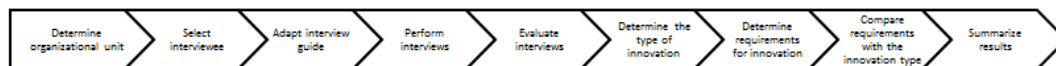
In this process step, the determined requirements for innovations within the selected area with the identified innovation type are compared. This

step is to determine if these two properties match or if they strongly differ.

Summarize results

As a last step in the process, the results are summarized and prepared. This step is necessary in order to have the necessary basis to carry out the further steps like an alignment throughout the organization.

These steps are required to be able to identify the innovation type of an organizational unit. The process is generally defined and thus applicable to any area, regardless of the focus of this area. To illustrate the process flow, this is shown in the following graph.



Graph-1 Process to determine innovation types (own illustration)

CONCLUSION

Innovation as part of managerial strategy is an ever growing issue for organizations as they historic or start-ups. Due to the very short cycles of ongoing development, especially in the field of information technology, it is increasingly necessary for many companies to find new or alternative innovation methods. Here, companies that have long been established on the market, often encounter difficulties in recognizing these new needs and taking the necessary steps quick and reliable enough[1].

It is particularly difficult to accomplish this task, as in many cases a consistent innovation strategy is set up and pursued throughout the company. Unfortunately, this does not take into account that in larger companies the requirements and thus also the organizational framework conditions in the individual organizational units can be different and therefore they have to be considered individually.

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