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AN OPPORTUNITY SEARCH METHOD FOR NEW PRODUCTS DEVELOPMENT

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1. Introduction

Generally speaking, companies are interested in new products which would bring them financial benefit. One of the more difficult decisions if not the most difficult one is which and what kind of products will really bring that. We believe that in order to do so, companies should adopt a systematic approach to opportunities search with a focus on taking account of the characteristic features of their company. An opportunity can arise from a new business orientation, cost reductions, simplification of operations, upgrading the existing products, new products platform, a new manufacturing process, new services or a new approach to retail and marketing services [Belliveau, 2003]. It depends on their business policy, development of the society where a company pursues its activities and the type of business operations. The answer to the question what exactly an opportunity is, also depends on the development period and research orientation of a particular researcher.

Processes and models for opportunities search are created in the business and in the technical and development environments. The business environment focuses on a company or on an individual businessperson. Therefore, the basic business activity also involves opportunities search.

The first process, termed a creative process, was proposed by Wallas way back in 1926. Since 1997, these processes and models have been subject to particularly intensive development. Opportunities and opportunities search have been approached from different viewpoints. The technical and development environment is characterised by development processes, which have replaced design processes. New products opportunities have been a topic only since around 1984, together with the development of the comprehensive development process, but they have been given a closer attention only recently. Development of comprehensive processes has been influenced by the awareness that creativity and innovations are becoming increasingly important factors for products development.

Different authors usually place opportunities search processes, created in the technical and development environment, at the beginning of the development process. Andreasen placed business opportunity search to the initial phase of the comprehensive development process. Cooper [Cooper, 2006] did the same in the Stage-Gate method and Di Benedetto [Crawford, 2003] in the new products development process and it is also the case in the NCD model [Koen, 2001] and at the beginning of the iNPD process [Cagan, 2002]. Linde developed a unique process, covering the development process up to the details definition phase. Specific development steps make it difficult to compare with other existing processes. We made this comparison which is shown in figure 1. Figure 1 shows the differences between processes. Almost all processes start directly with opportunity recognition phase. We realized that companies don´t have appropriate knowledge to start with this phase. R&D managers need a systematic approach how and when to start with opportunities recognition process. Starting

point of opportunity searching process is understanding the company and the market. This should be done before we start with opportunities recognition.

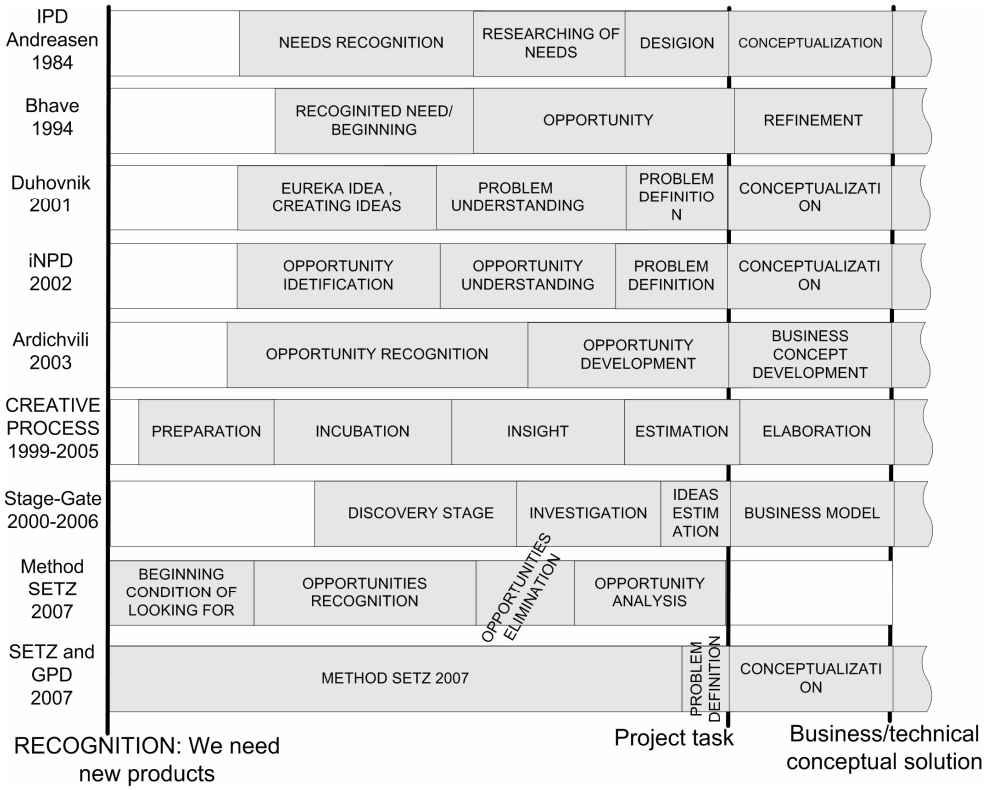

Figure 1. Starting point different opportunities recognition processes

The processes that appeared strictly in the business environment, have recognised the opportunities search process as independent and ending with a business plan, without connecting it with further comprehensive product development process. The absence of links between the development process and opportunities search process has a negative impact on small and medium-sized companies which have to be familiar with different methods and their interaction. In this case, the development process is discontinuous rather than continuous. The information and data flow between individual processes is not steady and it requires further adjustments of information and data or of individual phases of processes. The most explicit examples are processes, defined by Bhave [Bhave, 1994], McMullan [Long, 1984] and Hills [Hills, 1999], while Ardichvili [Ardichvili, 2003] has defined the business plan as a result of the opportunity identification process that facilitates the entry into the further development process. Laurie [Laurie, 2006] explains that a platform is usually created from a single product but it represents neither the further development process nor the development platform.

For this reason, it is not possible to define which phase of the development process could be entered with the process results. Our opportunities search method has been placed into the comprehensive development process – GPD (Figure 2), developed by Duhovnik [Duhovnik, 2004]. The GPD process has been upgraded with our method in the abstract part, where ideas for new products are being developed. The method results enter the golden loop of task definition, which continues from the abstract sphere to defining goals and requirements. Our method has resulted in defining a project task

and the GPD is entered at the problem definition point. The opportunity search method can be used also as a completely independent method. It results in defined project tasks which can become part of a development project portfolio.
Products development processes develop in the direction of increasingly systematic approach. Ardichvili [Ardichvili, 2003] believes that non-systematically discovered opportunities are more successful and investments bear fruit faster than opportunities, recognised via a systematic approach. Eureka ideas are usually exceptional but they are presented to the general public only after an individual person has assessed them. They are being realised only by the brave - entrepreneurial business persons. This is a reason why such ideas appear to be more successful. In contrast to Ardichvili, Laurie [Laurie, 2006] has attached great importance to systematic discovering of new products and platforms opportunities. A company has no time to wait for a member of the development team to come up with a great idea. The development staff should look for opportunities constantly and systematically. Our method introduces better systematics to the opportunities search process and a constant possibility of iteration between individual steps. It gives individuals opportunities to be creative and to produce Eureka ideas. The article presents a method for searching opportunities for a new product, taking into consideration a real business environment, which is part of a comprehensive product development process.

2. The opportunity search method

The method is intended for small and medium-sized companies in particular. It is of utmost importance that a company recognises the need for a systematic development of new products and that it is willing to invest in training its staff and introduction of systematic development methods. Andresen argues that initially, the comprehensive development process is less efficient and slower. However, gradually, as the company adopts a certain method of approach and develops its own development process on the basis of past experiences, it becomes way faster and more efficient.

Opportunity search has been divided into four steps (Figure 3):

Step 1 - boundary conditions for opportunity search: In the first step, the area of opportunity search is defined. The decision can be made after a close co-operation with the management, company analysis and the existing recognised trends on the market.

Step 2 - recognising opportunities: This step involves intensive gathering of information on a particular area from the viewpoint of four factors: social, economic, technological and legislative. We are looking for opportunities carriers, represented by wishes, fantasies, working processes and reference products in a particular area or sub-area. An opportunity has been recognised if opportunities carriers, together with the company's characteristic features yield a positive financial value. An individual "stores" the recognised opportunity in the domain of Recognised opportunities and Eureka ideas. Applying creative methods, we work towards recognising additional opportunities. This step allows more detailed work and breaking down sub-areas into smaller, more specific sub-areas.

Step 3 - elimination of irrelevant opportunities: Based on criteria and in co-operation with the management, irrelevant opportunities are eliminated.

Step 4 - opportunities analysis: a most important step where individual opportunities are confirmed after a detailed analysis. It is necessary to answer the question whether the recognised opportunities are realistic or we just believed it due to the lack of information. The procedure results in the suitability rank of opportunities and their description, which can already lead to some requirements for a new product or service, but most of all, it is given a consideration during the process of planning and allocating company's development projects.

2.1 Step one

Step one results in a selected sub-area and a motto for opportunity search on the basis of company's characteristic features and trends on the market. Step one is among the most important ones because a proper or improper choice of the opportunities search area for new products can significantly influence company's business operations and its future orientation. By selecting the opportunities search area

and focusing on it, the possibility to discover opportunities in other areas is reduced. It is true that taking this approach can lead to missing out on some opportunities but the high volume of information in case of detailed search in all areas would considerably extend the necessary time for opportunities search. In the case of shallow search, some opportunities for the company would certainly be overlooked.

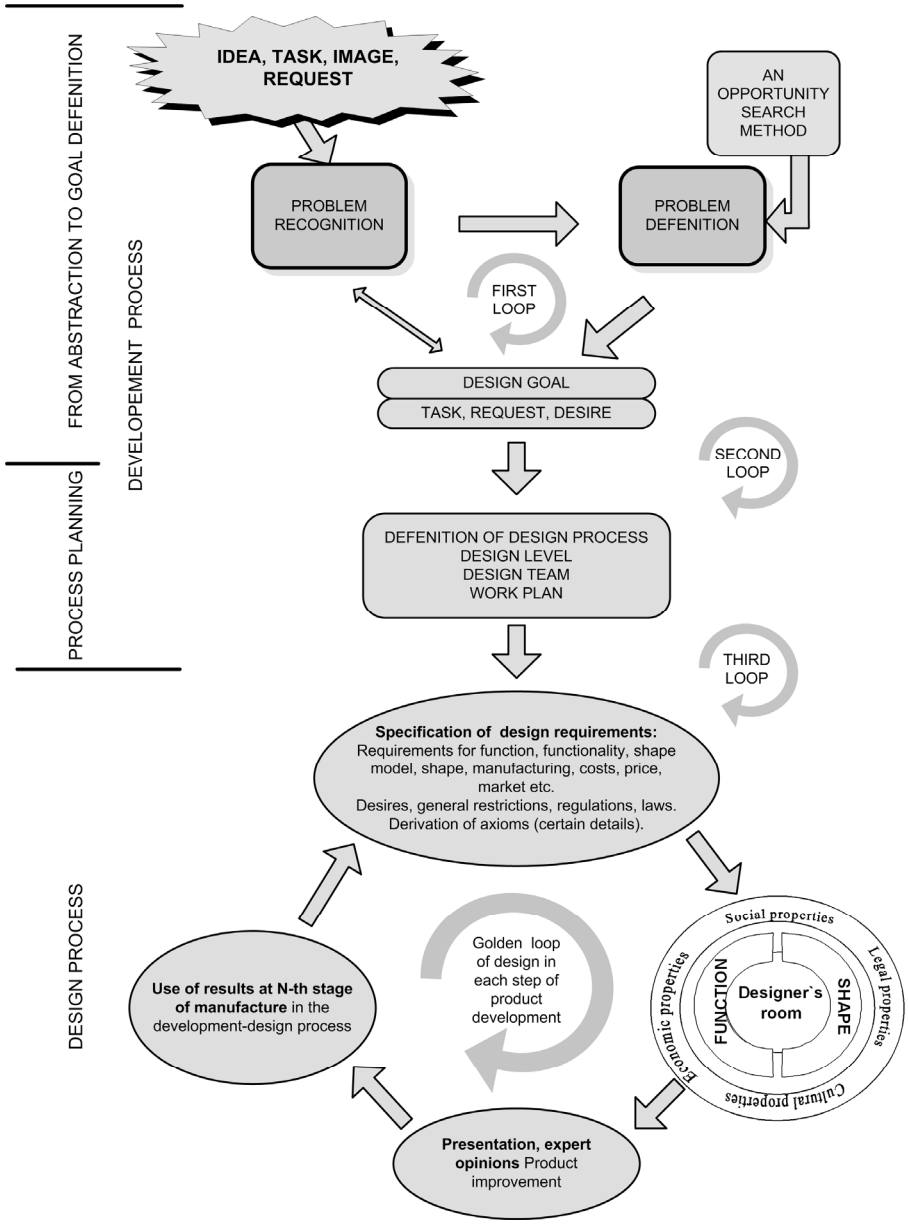

Figure 2. The opportunity search method, included in the GPD process

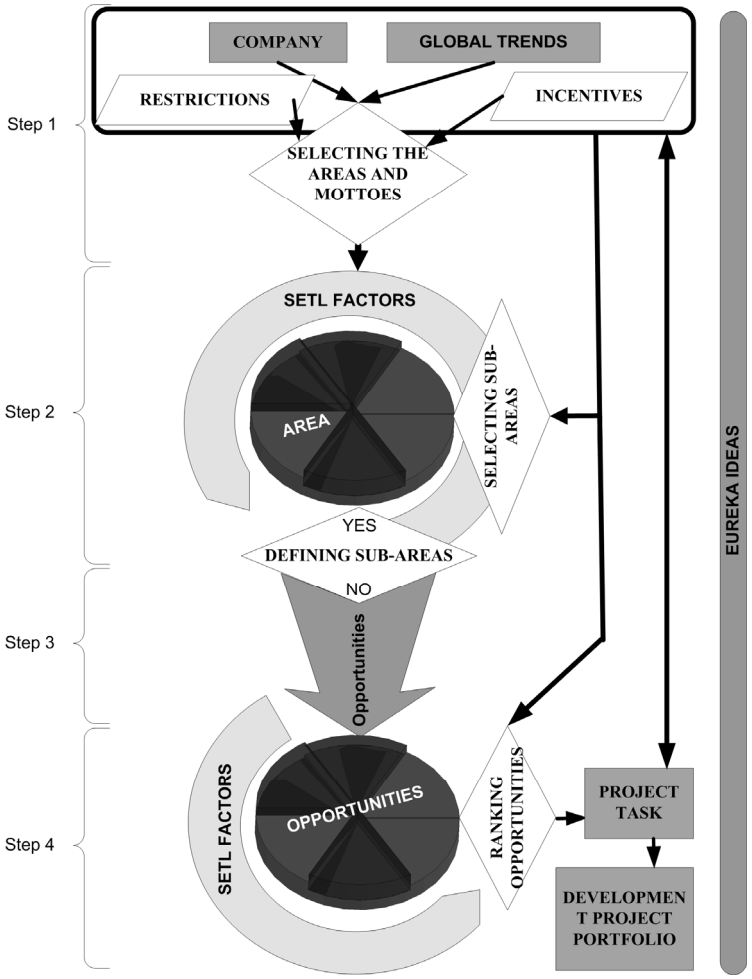

Figure 3. Opportunity search method for a new product development

In step one, the area [Benedičič, 2006] and the motto are selected. The selection is possible only on the basis of taking account of the company's characteristic features and global trends. Taking the company's characteristic features, the management and trends into consideration, the development team decides about the suitable area. Before taking the final decision, the team defines restrictions and incentives, representing the company's characteristic advantages and disadvantages.

The company's characteristic features are definitely a foundation for selecting the area and the motto for further opportunities search. It is necessary to acquire the characteristic data and information on the company and its business operations. Information and data on the company, affecting the selection of the area and the motto are as follows:

Strategy: Our method takes account of the strategy as one of the elements that can direct the opportunity search in a specific area. The company's strategy and mission are indicative of its development trend. The company's strategy can already predict the target market or even the product development task. It is necessary to be aware that the company's strategy can change on the basis of recognised opportunities.

Sources: The method takes account of natural, human, organisational and technological sources. By means of an analysis of available sources and their potentials, it is possible to assess the company's capacities. It is necessary to define the knowledge that a company can acquire through connections with scientific institutions and the company's strategic development. Some natural resources can serve as a direct source of new opportunities.
Production: It is necessary to be familiar with the existing production programme and products, produced in the past. There are two other important factors: the size class of the produced products and type of production.
Markets and channels of trade: Markets and channels of trade are very important when an area is being selected. Partial presence of a company on a market already means some degree of understanding and recognisability on the market. Because companies strive for increased growth with a new product, it is important to know the expected growth of a specific sector in the future, which can be an indicator of the growth in sales of the new product.
These are the company's key factors that are to be taken into consideration when selecting an area. The mentioned data by themselves can be indicative of a specific area but they can also encourage us to define a new, adjacent area on their basis.
The management has and should have a decisive say in deciding about the development of new products because in the long term, it is closely connected with the success of the company. In step one, our method requires the presence of the company's management because selecting the area is of utmost importance. The choice determines the company's future development orientation and the management's role in this process is crucial. The management submits its opinion and seeing the situation, comments on individual analyses and responsibly creates the basis for the execution of the method's subsequent steps.
Special attention should be paid to taking trends into consideration as early as when deciding about the area where opportunities will be searched. There are global trends, affecting different segments of our life. Global trends should be examined and applied to individual defined areas. Understanding the mentioned trends can facilitate our decision about the area for our future activities. A trend can make an area promising.
The most important step in the first step of our method is selecting the area where opportunities for new products will be searched. By detailed analyses of the company, market and global trends which are to be applied to trends in the company's area, the necessary information are gathered. On their basis, the area of opportunities search is assessed and selected. Before the assessment, the team, together with the management, should review the gathered information and complement the list of defined areas with related or adjacent areas. To do this, they can use one of the creative methods. The team should first eliminate irrelevant opportunities, based on the criteria it had set together with the management. If more than one area remains, the team should apply the AHP method, by which it assesses and creates a suitability rank of areas. The first area is the selected area for further activities in step two.
Choosing the motto for searching is the next very important decision to be made. The motto should be defined after selecting the area in co-operation with the management. There is an abundance of information available on products, technologies and knowledge for a specific area. For this reason, it is necessary to choose a motto or fil rouge of the information search process. It is useful only in the first cycle of step two. The motto can be the basic function of a particular product group, depending on what goal we want to achieve with the new product. Should it fit into the existing platforms or should it fulfil a specific mission of the company? It is important that the motto has a broad sense. No motto is necessary if the search area is narrow. On the basis of the selected areas, the team and the management should decide whether the motto in necessary or not.

2.2 Step two

The opportunity search method helps companies improve the efficiency of their work. It improves the chances of a successful opportunities search process although the method is not a guarantee of success. The second step involves intensive information gathering on a particular area, based on four recognised influential factors: social, economic, technological and legislative. We are looking for

opportunities carriers, represented by wishes, fantasies, working processes and reference products in a particular area or sub-area. An opportunity has been recognised if opportunities carriers, together with the company's characteristic features yield a positive financial value. An individual "stores" the recognised opportunity in the domain of Recognized opportunities and Eureka ideas. Applying the creative recognition method, this set is further compiled. Step two (Figure 5) is a cyclic one, with each cycle adding to the volume of information and thus deepening the understanding of the area or sub-areas. This step allows more detailed work and breaking down sub-areas into smaller, more specific sub-areas.

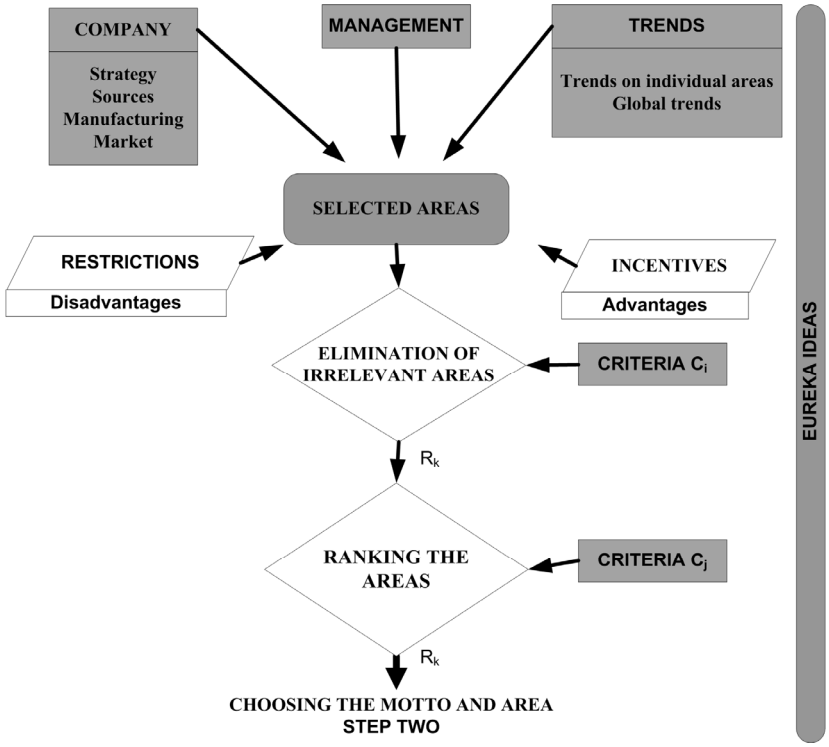

Figure 4. Step one

SETL factors

In order to understand opportunities, an adequate volume of quality information is required. Combining information from the market or the environment and the company can improve chances of a successful discovery of an opportunity for the company, as well as structured and systematic search of information. The structure and volume of information, necessary to discover an opportunity has changed with the development of methods.

With our method, information gathering is systematic and structured. The information are the basis for a successful recognition of opportunities. A group of information, relevant to the company, has been chosen in step one, where advantages and disadvantages of the company were recognised. In step two, the focus is on the information from the market and the environment. The structured gathering of information has been upgraded to four influential SETL factors:

Social factor: focuses on the society and its changes. It is necessary to pay attention also to interactions with other factors. We are interested in the current situation and expected developments in the future.

Economic factor: it is the financial factor, whose purpose is to assess the financial potential of the area and later also the opportunity
Technological factor: among other things, it includes a good understanding of current technologies, scientific discoveries and future technologies. They can become important sources of new opportunities.
Legislative factor: lately, it has been an increasingly important factor for opportunities search as well as devising new products. Some laws can encourage a trend in a particular area while on the other hand, trends can dictate adoption of new legislation. New discoveries and radical innovations can also give rise to adoption of rules and laws and vice versa.
The source of information is of utmost importance. The more diverse the source of information the greater the volume of different information, which enhances the probability of diverse recognised opportunities. There are primary and secondary sources. Original information, gathered with a special purpose, are obtained from primary sources. Information, originally gathered for other purposes, are obtained from secondary sources. Gathering information and data from primary sources is a difficult job as it takes a lot of direct personal communication, which in turn requires more human resources. Because the gathered data often involve personal opinions, it is necessary to convert them from a personal formulation to impersonal or general formulation. From different information, it is possible to deduct a third information, which can be even concealed. At the beginning of the opportunity recognition step, secondary sources are the first source of data and information search. They do not require personal communication and they are mostly accessible without major problems. The big volume of the information and data is more of a problem because it is necessary to extract the most important parts. Which sources are used and to what extent depends on the research area and a potential division into sub-areas. In any case, secondary sources are more widely used in the initial part because one is still getting familiar with the area and defining its boundaries. Primary sources play the most important role later because the biggest volume of information and data can be expected from direct conversations with users, specialists and others and from observing working processes. The definitions of opportunity tell us by themselves that we are not looking for direct opportunities but the so-called opportunities carriers. An opportunity carrier is the starting point, sometimes also and idea without material and concrete embodiment.

Creative opportunities recognition and decision to continue

At the end of each cycle in step two, there is creative recognition of opportunities. Studying secondary and primary sources generates different opportunities that are “put aside” to a purpose-built area. However, these opportunities alone are not sufficient and it is necessary to recognise more of them. The starting point of the process of creative recognition of opportunities is data and information, the so far recognised opportunities, Eureka ideas and opportunities carriers, recognised on the basis of the data and information, and collected during the preceding work. By using the creative methods we are trying to encourage creative thinking inside the team and each individual.
The volume and quality of data and information, symbolised by the main part of the step two diagram (Figure 5) is constantly being complemented but there is a point where it is necessary to decide whether to continue or not. It is possible to continue with step three or a new cycle of detailed information and data gathering. In case we decide to continue the information gathering process, it is necessary to decide whether to continue on the same level – sub-area – or go deeper in the research area to sub-areas. There is a possibility that in the Eureka idea sphere, a new area, suitable for further research, appears. If the decision is taken to narrow the scope of research to a smaller number of sub-areas, their number should be reduced on the basis of the criteria, set in co-operation with the management. The criteria are set according to step one. The criteria can be set also independently by the management but it is best to do it together with the team. In case that more than one area remains, the AHP method should be applied to assess the sub-areas and get the suitability rank of individual sub-areas for further search.

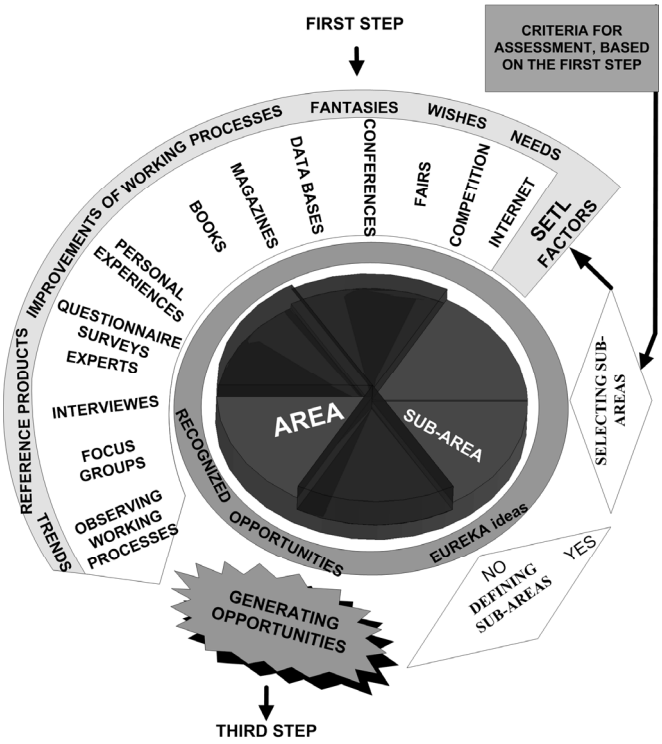

Figure 5. Step two

2.3 Step three

In this step, the unsuitable opportunities are eliminated according to the criteria, set together with the company's management. The criteria should enable a clear distinction between suitable and unsuitable opportunities. An opportunity that has been designated as unsuitable according to any criteria should be eliminated unless the company's management has a different opinion despite the assessment. Note that all four factors should be taken into consideration. This step also allows the possibility of Eureka ideas (Figure 6).

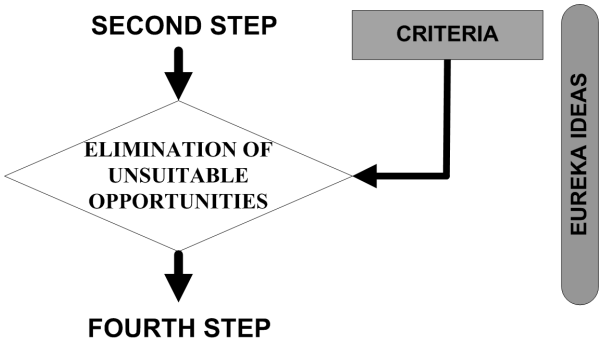

Figure 6. Step three

2.4 Step four

Before the final definition of what exactly a suitable opportunity means, it is necessary to examine them closely and recognise the potential of each opportunity. It is necessary to answer the question whether the recognised opportunities are realistic or we just believed it due to the lack of information. The procedure results in the suitability rank of opportunities and their detailed description, which can already lead to some requirements for a new product or service. In step four (Figure 7), the opportunities are analysed up to the point where the company is able include them in the range of its development projects. In case that we want to further analyse individual opportunities and find out the suitability of an opportunity, it is necessary to carry out a detailed analysis on the basis of SETL factors. A closer attention should be paid to primary sources because in order to confirm an opportunity carrier, it requires more personal contacts with users. We created the so-called opportunities parameters and defined more precisely what data and information should serve as a basis for quality decisions on the potential of opportunities:

The opportunity carrier: confirms whether needs, improvements, working processes etc, representing an opportunity for a new product, really exist.

Users and their benefits: how the user sees the opportunity and the benefits it will bring

Trends: Trends analysis. How trends encourage the opportunity. Has the trend started developing recently or is it already declining.

Competition: It is necessary to check the competition's capacities, abilities and dangers.

Selling potential: We should determine the size of the market and estimate the sales.

The necessary resources: We should define the necessary resources to develop the opportunity and see whether the company has enough of its own resources available. If not, which and where should the company look for them.

Ranking the opportunities

Ranking the opportunities is one of the most important decision-making phases for further product development process. A wrong decision can incur big financial losses and also bankruptcy of the company in case of big projects and big risks. The opportunity ranking means the end of step four and the opportunity search method. We believe that this is a very suitable starting point for further activities in subsequent development phases of the comprehensive product development process. Despite the created opportunity rank, the company's management should decide either on their own or together with the team, which opportunity they will pick up to continue the development process. Harmonisation with the development project portfolio is necessary in advance. The data which each opportunity should involve are broad enough to enable proper ranking of the opportunity within the development project portfolio. The opportunity rank can be created by means of the AHP method, based on mutual comparison of opportunities.

3. Examples

Practical implementation of the method in the company yielded new understanding and most of all, verification of the method, its steps and correctness of the approach to the development of new products. The method was tested twice. The first test was carried out in an industrial enterprise with 300 employees, and the other one on a farming establishment, belonging to the category of micro-enterprises.

In both of the enterprises, several opportunities have been recognised. In the industrial enterprise, opportunities in the civil engineering area have been recognised, such as automation of certain working processes by means of some new innovative products. Opportunities could be developed further in the phase of prototype testing and protection of intellectual property.

In the agricultural enterprise, where manual work and inflexibility of working hours is the big problem, two opportunities were further developed. The first one was highland cattle breeding, which has already yielded first results – a considerable decrease in the necessary workload. The other opportunity is exploitation of a natural resource – water. The application to obtain concession for a hydroelectric installation has been filed. The investment should return in seven years.

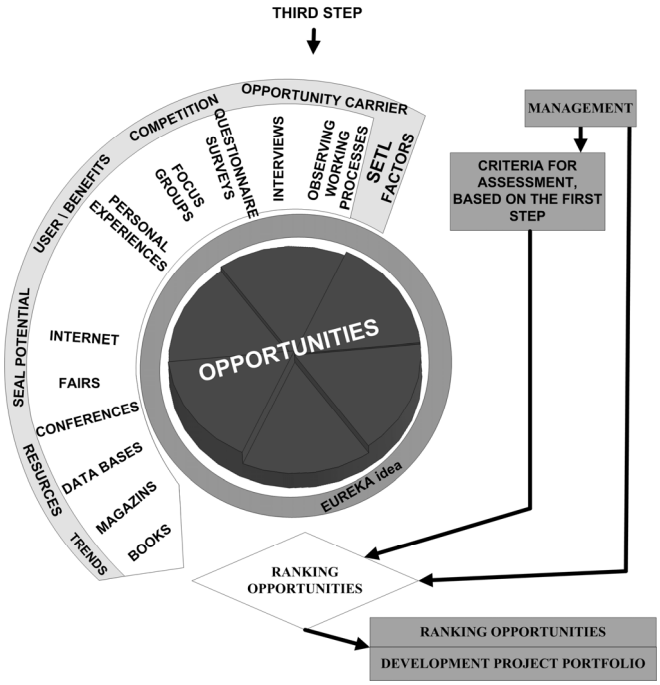

Figure 7. Step four

4. Conclusion

A method of independent tasks has been developed. It is systematised and provides for repeatability, traceability and iterativity of the opportunity search process, from the decision to develop a new product to the inclusion of the opportunity in the development project portfolio. Creativity is permitted and encouraged during all steps of the method.

The initial part of the method contributes significantly to the systematics of development processes. After the decision for a new product has been taken, the focus is not immediately on the opportunity but a concrete business environment and global trends are analysed first. Only then do we decide in what area to look for opportunities. It makes the steps systematic, traceable and iterative in the initial part of the method because we know why a particular area has been selected. In case no opportunity has been discovered, it is possible to go one step back and focus on another area or sub-area. The method has been systematised in such a way that it makes the recognised and ranked opportunities suitable to be included in the development project portfolio and further development. It has been proved by two examples because the development activities on the selected opportunities continued to the problem definition phase.

A systematic approach to searching an opportunity for a concrete business environment through taking account of the social, economic, technological and legislative factors, has increased the chances of recognising a suitable opportunity for a concrete company. In steps two and four, the systematicity of the method has been significantly complemented with social, economic, technological and legislative (SETL) factors. They have been studied comprehensively for the first time by our method. A well-organised search with SETL factors enabled a good overview of the data, which made it possible to distinguish between important and less important data, which is of particular importance for creative recognition and assessment of opportunities. According to the technology, the required knowledge and the downstream market, the recognised opportunities were close to the company where the method was carried out.

A recognised and subsequently properly realised opportunity increases company's chances of a market success.

The increased chances of the product's market success has definitely been proved by the current development activities. Our estimations show that by implementing the first opportunity (discovery for an industrial enterprise) on the market, the productivity of the current working process will be improved by 20% and intermediate goods savings will amount to 10%. Several months' experiences, gained in the highland cattle breeding, have shown that the terrain and environment configurations are suitable for such activity and that the main objective – to reduce the time consumption – has been achieved. The animal husbandry and care time consumption lowered three times and at the same time, the necessary work can be carried out at any time during the day or, subject to proper organisation, even every several days.

It is a proof that by applying the opportunity search method, opportunities for new products have been recognised. Subject to proper realisation, they have improved the chances of the company's market success.

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