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Module 4:

Idea evaluation methods and techniques

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Contents

1.   Introduction

According to the 2007 "*European Innovation Scoreboard"* innovation policy must remain at the centre of the Lisbon strategy. The gap in overall innovation performance between the EU and the US is narrowing very slowly and calls for intensive actions in companies and in national innovation systems and competitiveness policies. In its Communication *"Putting knowledge into practice: A broad-based innovation strategy for Europe"* dated September 2006, the Commission outlined EU innovation strategy for the years ahead. As a Community approach, it supports regional and national measures foreseen in the context of the Lisbon process. Whereas the previous Communication from the Commission on innovation from 2005, entitled "*More Research and Innovation*", focused on investing in research and on supply-driven innovation, the broad-based innovation strategy broadens the approach and puts greater emphasis on demand-driven innovation.[1]

The need to improve competitiveness of companies through their innovation performance demands continued implementation of the broad-based innovation strategy, especially in SMEs which form the great majority of European business sector. The knowledge should be put in practice in a way to accommodate the creative potential in companies and society.[2]

The project *Creative Trainer* deals exactly with the issues how to foster creativity and innovativeness of companies, particularly of small and medium sized, as majority of them are not in a position to perform their own research and development activities. They have to rely heavily on their own, though scarce resources. Increased globalization, international competition, short time-to-market cycles, increased

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[1] EU Commission (2008): *Information note from the Commission services: Progress report on the Broad-based innovation strategy*, http://ec.europa.eu/enterprise/innovation/doc/bbi_strategy_progress_report_march_2008.pdf

[2] European Commission (2006): *Putting knowledge into practice: A broad-based innovation strategy for the EU*, http://eur-lex.europa.eu/LexUriServ/site/en/com/2006/com2006_0502en01.pdf

demand for quality etc. call for looking for simple but effective methods and techniques of idea generating, evaluating and exploiting.

The module 4 of the *Creative Trainer* project is designed to search for methods and techniques for idea evaluation. As we will show later on there is a broad spectrum of them, even though not all of them are simple and effective at the same time.

## 2. A need for more holistic approach to idea evaluation

We need to keep in mind that methods and techniques for idea evaluation are just tools; and should be used as such. Tools don't solve competitiveness issues automatically. They should be used in accordance with the overall company strategy and the ideas selected in the evaluation process must be implemented.

To show the complexity of improving competitiveness of SMEs we can exploit some of the idea expressed in the *IMP³rove* project. European Commission established *IMP³rove* project with the aim to improve the innovation performance of SMEs in Europe[3]. The model approach of the project is holistic (it covers all areas of Innovation Management) and modular (company can select in which area it needs the improvement and still keep the »big picture« in mind). It is based on A.T. Kearney's »House of Innovations« (see *Figure 1*). [4]

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[3] Diedrrich, E., Engel, K., Wagner, K. (2006): *European Innovation Management Landscape*, European Commission, Brussels, pp. 6.
[4] Wagner, K. (2007): *Characteristics of Leading Innovators.* INNO-Views Policy Workshop "Innovation Culture" Eindhoven, December 13th, 2007.
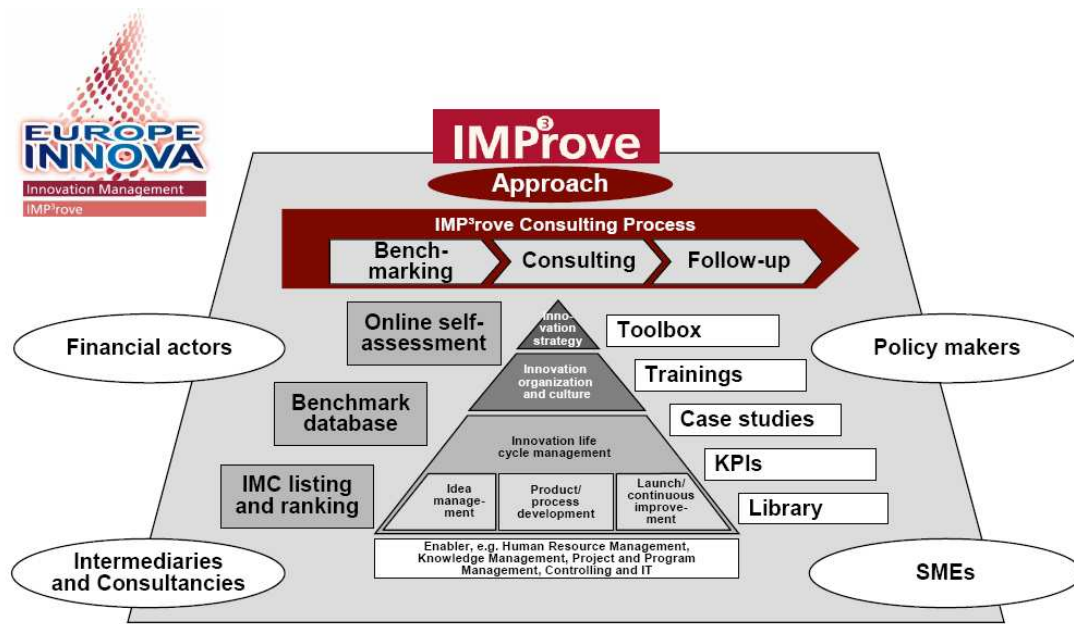
SME= Small and medium sized enterprise; IMC= Innovation Management Consultancy; KPI= Key performance indicator
Source: IMP³rove Core Team 2006

A.T. Kearney 29/03.2007/12482b   11

Figure 1: The IMP³rove approach (by A.T. Kearney)

The *IMP³rove* approach draws our attention that not only generating better ideas but also minimizing development time and effective commercializing of new products has to be taken care of. As we can see from the above picture the idea management (or even more specifically the idea evaluation phase with the tools and techniques needed) is a very tiny part of the whole process from the stage of perceiving the need to the final result of satisfying the need.

Idea Management is just a step in the overall process from idea to success.
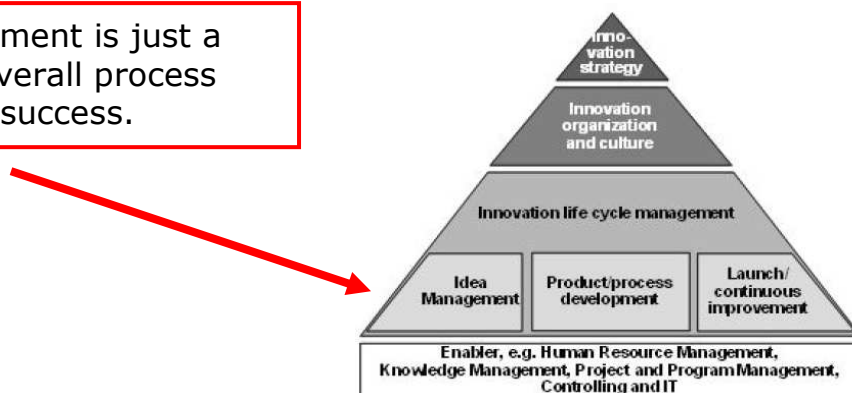
It should therefore be kept in mind, that the creation of ideas and their evaluation is a part of a broader picture[5] that includes goal setting, target definition, evaluation of capabilities company has on its disposal, etc, as it can be seen from the *Figure 2*.
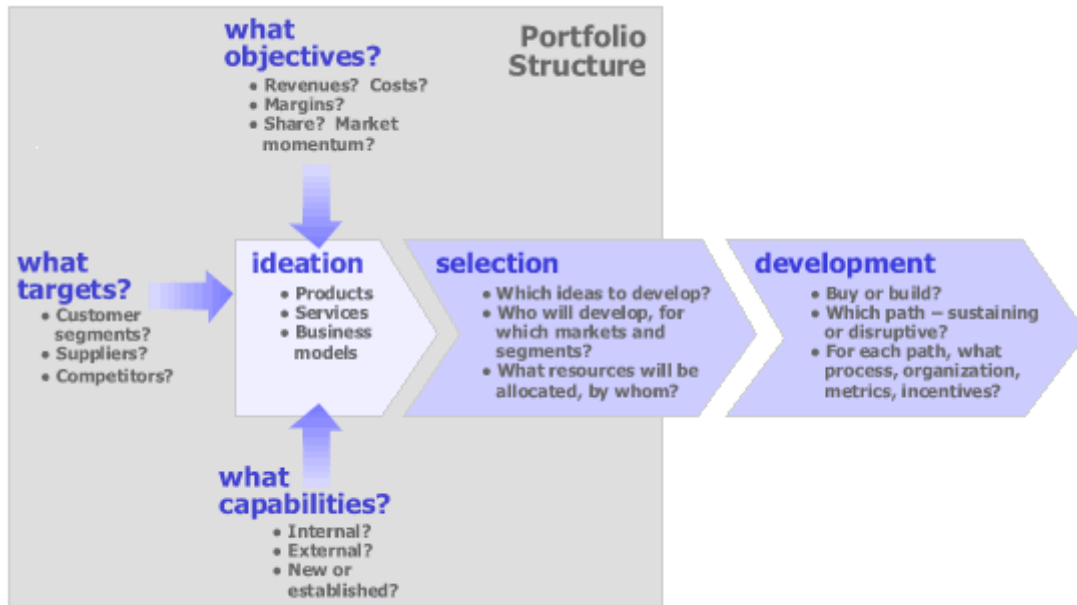
Figure 2: Portfolio Structure (by Eos Consulting)

Net search[6] for »innovation management« returned 1.380.000 hits, 238.000 hits on »idea management« and 23.900 hits on »idea evaluation«. To put some perspective on the topic we have to take a closer look at the process how ideas are managed.

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[5] *Innovation Management and Governance*, http://www.eos-consultingllc.com/govinnovation.htm
[6] It was performed in Google over Firefox on August 18th, 2008.

3. Idea management process

Every idea management process starts with idea generation. In the framework of *Creative Trainer* project the »responsibility« for idea generation goes to other modules such as *Idea Machine*, where as many ideas as possible should be generated. As we have focused on the companies the main concern is not only the selection of ideas but also whether the selected ideas could contribute to sustained competitiveness and creating sufficient level of profit. *Figure 3* shows the importance of taking into account the time span from idea generation to profit creation.[7]
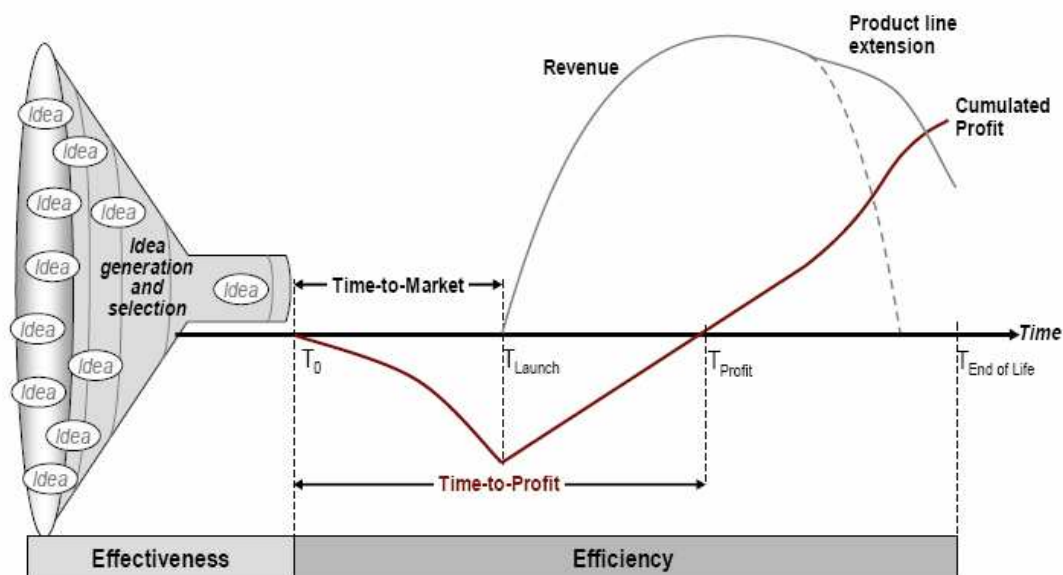
Figure 3: Time span form idea to profit (Wagner, 2007)

Another look at the process of getting idea into life is the one exploited by SAP[8]. Their approach takes into account the fact that the idea to be

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[7] Wagner, K. (2007): *Characteristics of Leading Innovators.* INNO-Views Policy Workshop "Innovation Culture" Eindhoven, December 13th, 2007

[8] Taylor, P. (2007): *SAP Inspire – Laboranova Living Lab*, SAP Research, CEC Belfast December 2007, http://www.laboranova.com/wp-content/uploads/2007/12/taylor-2007-laboranova-sap-inspire-ll.ppt

implemented has to be approved by lead entrepreneur, manager or board (*Figure 4*).
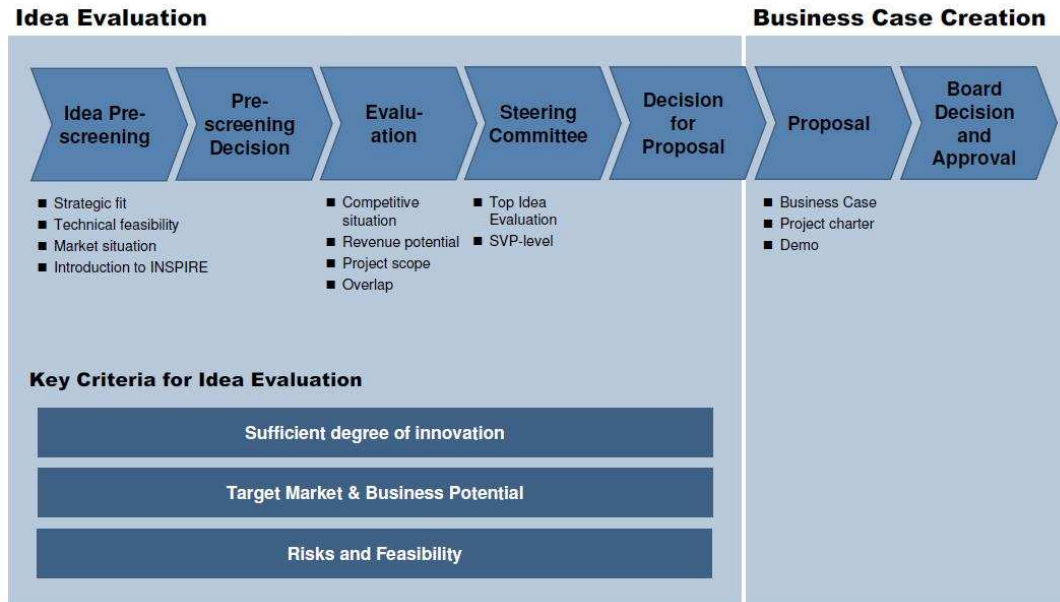
Figure 4: SAP approach to idea evaluation and business case creation

Let us conclude the introduction into idea management process with Robert Cooper's concept of "stage-gate« in the new product/service development process[9]. **Stages** are steps in the process from idea to full commercialization and **gates** are screening activities or set of criteria that the idea/project has to meet before it moves from one stage to another.

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[9] Cooper, R. (1988): The New Product Process: A Decision Guide for Managers, *Journal of Marketing Management* 3, (1988): 238–255.
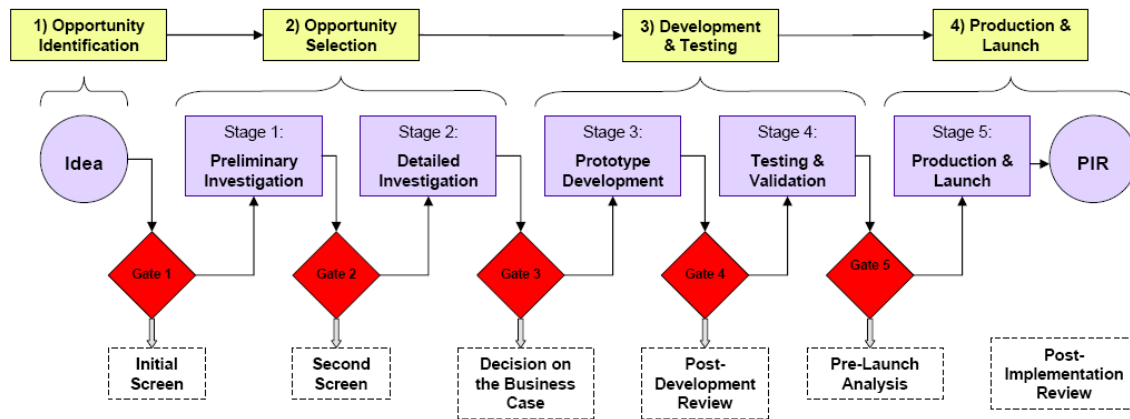
Source: Winning at New Products, Robert G. Cooper, 1993

Figure 5: Cooper's Stage-Gate process (Cleveland 2005)

Stage-gate model is important because it draws our attention to many barriers that are present in the process of implementing the idea. *Figure 5* shows five stage Cooper's model.[10] Again, it can be seen that idea evaluation tools and techniques must be implemented in the context of understanding the process and company objectives.

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[10] Cleveland, J. (2005): *A Framework for Manufacturing Innovation*. Draft 5.0, IRN, Inc,
https://www.mriwm.com/Public/Public%20Documents/Innovation%20Seminar/Innovation%20Framework%205.0%20-%20Right%20Place,%20Inc.%20-%20John%20Cleveland.pdf .

4. Process from identification of ideas to their implementation

To understand the complexity of the whole process from identification of ideas to their implementation, we need to decompose it into consecutive phases. Different authors would make different stages and assign them different names. For the *Creative Trainer* purposes we shall follow the natural process of idea implementation which runs in seven consecutive stages (*Figure 6*).

The stages are:
1. Identification and organization of ideas
2. Making a list of available methods and techniques
3. Building up a set of criteria to select a particular method or tool
4. Selecting the tool or method
5. Implementing the method
6. Selecting the idea
7. Idea implementation
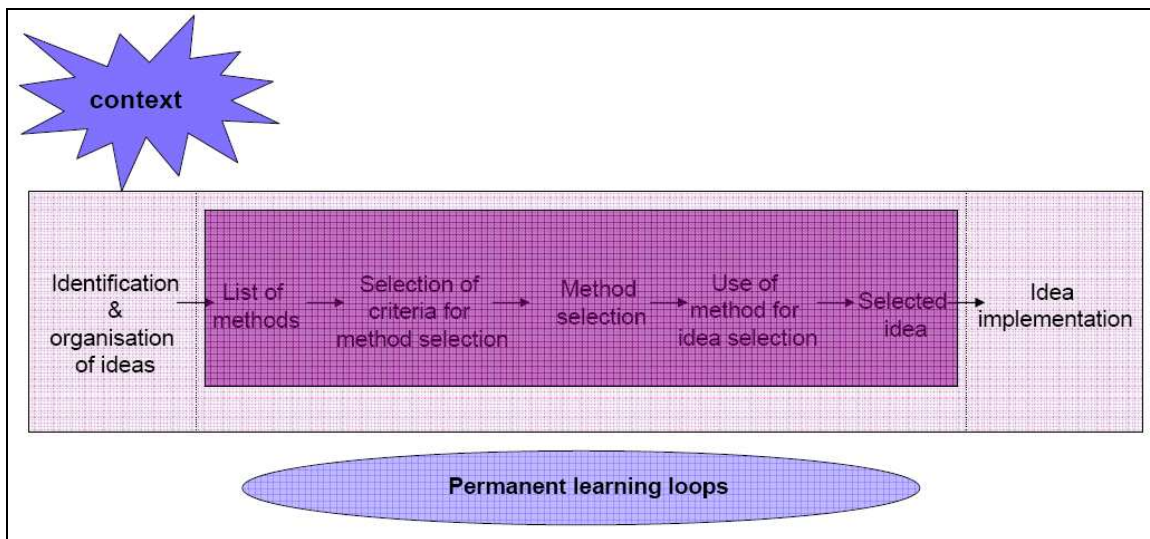
Figure 6: Process from identification of ideas to their implementation

The stage of identification and organization of ideas is supposed to be the final result of the phase in which ideas are generated and systemized[11]. This is the input into evaluation process.

To start using the methods and tools for idea selection we have to be familiar with them. The first step is therefore to make them evident to everybody who is going to take part in the evaluation process. List of available methods and techniques should be constantly updated and participants trained to use them.

After becoming aware of the methods and tools we have at our disposal we need to decide which one is the most appropriate for the specific task. It is clear that not every method or evaluation tool is appropriate for any type of ideas to be evaluated or decision to be made.

If we would have to decide, for example, on a novelty to be introduced into a company we would need to take into account that there are many different types of novelties[12]:

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[11] Within the *Creative Trainer* project the process of idea generation and systemisation is part of previous moduels, specifically the *Idea Machine*.
[12] Mulej, M., Rebernik, M. (1989): A wholistic typology of innovation as a useful way to promote the interplay of natural, social and political systems in firms. In: *Proceedings*

A. Regarding the **content of novelty** the following types can be distinguished:

1. Program innovations – introduction of a new product which is well accepted by the customers.
2. Technical and technological innovations – these innovations improve products and production processes.
3. Organizational innovations – introduction of new organizational forms of work and cooperation. Such innovations include: human relationships, human resources management, learning organization, TQM etc.
4. Managerial innovations – introduction of improved relationships between managers and subordinates; new styles of management which encourage and activate all employees in order to make work organization a collective resource of innovation.
5. Methodological innovations – introduction of new methods of management and cooperation which support managerial innovations in realization.

B. Regarding the **consequences** the following types can be distinguished:

1. Radical innovations – significant (and useful) changes in a firm.
2. Incremental innovations – innovation which proceed as a series of small steps. Such innovations are very important especially from sociological and psychological viewpoint since their author can be almost everyone.

C. Regarding the official **duty** to innovate:

1. Inside – among inside innovations are those which are carried out and done by people in their working place.
2. Outside – are innovations, created by the employees in areas for which they are not directly responsible.

It is evident that not the same tools can be used for evaluation of e.g. costumer acceptability of product novelty and e.g. introducing a new internal organization of the company.

When the method or tool is selected we can start to use the tool, do the evaluation and select the idea. Even though by selecting the idea the evaluation process is formally accomplished to have any value for the company it also has to be implemented. The process of implementation is separate process and another methods and tool are to be used to provide its effectiveness.

To make the evaluation process effective we should be aware of the context in which evaluations are taking place. By context we understand values, rules of the game, cultural impacts, social milieu etc. within which the process is taking place.

5. Selected methods and techniques for idea evaluation

There is to be found a very broad array of idea evaluation tools and methods. According to the scope and goals of *Creative Trainer* project we made a shortlist. For each of the method we provide basic description of the method, name similar methods and make a short description of basic features that are to be taking into account when deciding on which method the select for a particular task. We have selected and described the following 29 methods:

1.   ABC analysis
2.   AHP-based approach
3.   Anonymous voting
4.   A-T-A-R model
5.   Check lists for business idea evaluation
6.   Consensus mapping
7.   Cost-benefit analysis
8.   Decision trees
9.   Delphi technique
10. Evaluation matrix
11. FMEA - Failure Modes and Effects Analysis
12. Force field analysis
13. Grid analysis
14. Idea advocate
15. Impact analysis
16. Kano model
17. Kepner Tregoe matrix
18. NAF – Novelty Attractiveness Feasibility
19. Nominal group technique
20. Paired comparison analysis
21. Pareto analysis
22. PMI analysis
23. Prioritization
24. Repeatable questions diagrams
25. Sticking dots
26. SWOT analysis
27. TRIZ

28.   Value analysis
29.   Vroom-Yetton-Jago Decision Model

Mainly, we have selected methods and tools that are relatively easy to use and can be also adapted for implementation in smaller companies.

5.1   ABC analysis

It is an analysis of a range of items which have different levels of significance and should be handled or controlled differently. Items (such as activities, customers, documents, inventory items, sales territories) are grouped into three categories (A, B, and C) in order of their estimated importance:

- 'A' items are very important,
- 'B' items are important,
- 'C' items are marginally important.

It is useful method in many areas and is very simple to use individually or in group.

The ABC analysis can be used for idea evaluation in two different ways.

- The first possibility is to group several ideas according to their importance in group A, B or C. The criteria for assigning the level of importance must be defined in advance.
- The second possibility is to analyze the selected idea in two stages. In first stage, by a method of brainstorming as much items of this idea as possible are listed. In the second stage, we group them according to their importance into A, B and C category.

To group ideas we can use a template table with three rows, named A, B and C as shown below to which we categorize ideas.

A items (the most important)	B items (relatively important)	C items (less important)

Similar to ABC analysis is the Pareto analysis.

5.2 AHP approach

Analytical hierarchy process (AHP) is a method, based on hierarchical approach to idea evaluation and decision making. It assesses one idea on multiple criteria and structures them according to their relative importance.

AHP is very sophisticated method, appropriate for solving complex problems. It is applicable in many areas but criteria have to be carefully weighted. It is mainly a group technique, which enables detailed insight into decision making process. Similar methods are "Weighting and rating" and "Paired comparison analysis".

AHP consists of a hierarchy of criteria and sub-criteria cascading from the decision objective or goal. By making pair-wise comparisons at each level of the hierarchy, participants can develop relative weights, called priorities, to differentiate the importance of the criteria by ranking them on different scales (e.g. percents, scales from 1 to 10). The overall problem should be split on many evaluations of lesser importance, while keeping at the same time their part in the global decision.

The analytical hierarchy process consists of 4 steps:
1. decomposing,
2. weighing,
3. evaluating, and
4. selecting.

In decomposing step, the problem is structured into several manageable sub-problems that are easily to solve. Every sub-problem comprises goals, criteria (evaluation parameters) and alternatives, shown in picture below.
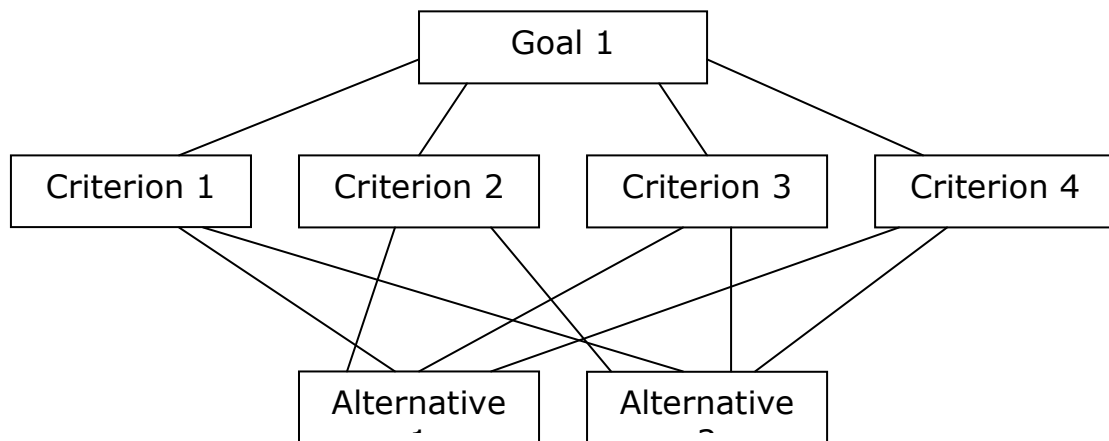
In weighing step, every criterion from first stage is weighted according to its importance. Sum of weights must be 100%. In evaluating, alternatives are scored and compared each one to others. Finally, alternatives are selected according to their scores.

The specific steps in analysis by AHP are the following:
1. Define the problem and specify the solution desired.
2. Structure the hierarchy from the overall managerial purposes through relevant intermediate levels to the level where problems would be solved.
3. Construct a pair wise comparison matrix of the relative contribution or impact of each element on each governing objective or criterion in the adjacent upper level.
4. Obtain all *n(n-1)/2* judgments specified by the set of matrices in step 3.
5. Synthesize the comparative judgments to determine the relative value of elements.
6. Repeat step 3, 4, and 5 for all levels and clusters in the hierarchy.
7. Apply the matrix computation among the relative value of elements in each level to determine the priority of elements in the lowest level with respect to the goal in the highest level.

5.3 Anonymous voting

The method is based on anonymity of participants' choices. It is a group technique, especially useful for groups that have significant pressures or anxieties between participants.

The method is useful for selecting among many ideas. It starts with list of ideas from idea generation process, which are visible to all participants.

Main disadvantage of the method is that it is very subjective and based on individuals' opinion. Additionally, because of anonymity of the method individual criteria for idea ranking are not clear. It is mainly appropriate for early phases in idea selection process.

This technique requires a leader who manages the whole selection process. Every participant has to select 10-15 % of ideas from the total list of ideas and rank them from A (most preferred) to the least (at least preferred). Members individually and privately select a short list of ideas and write them on a list and rank them according to their significance. The leader gets lists from all participants and shuffles lists to get anonymous responses. For implementation of this method, a table with ideas listed in accordance to their importance should be prepared, as shown in table below.

Rank	Idea
A	
B	
C	
…	

Leader can decide how many ideas every participant has to select from the list.

5.4   A-T-A-R model

The acronym ATAR stands for **A**wareness-**T**rial-**A**vailability-**R**epeat, and is based on concept of 'diffusion of innovation'. This method could be used in all stages of new product development; however it is the most appropriate to use it in the area of marketing to estimate who the potential customers could be, and in business decision making. It could be both, individual or group technique.

The method is used to assess shares of following issues:
- *Awareness*: represents a share of target market that is aware of product or idea.
- *Trial*: represents a share of those aware costumers who will try a product.
- *Availability*: is a share of efforts needed to find a product on the market.
- *Repeat*: is a share of costumers who will buy a product again.

The method is highly focused and therefore not appropriate for general idea selection.

5.5 Checklists for idea evaluation

There is huge selection of different checklists, handbooks and software for business opportunity evaluation and for business planning. They are all meant for evaluation of different business ideas and for checking if they are eligible, feasible and economically well-grounded. In normal business life there are always a lot of business ideas but only few of them turn out to be business opportunity and even less turn into a profitable venture. We will show you few cases of such checklists and provide some URLs to find more. The examples of following checklists are provided:

- Scoring the suitability of business idea
- Evaluating an idea for a business or product
- Evaluating new product idea

5.5.1 Scoring the suitability of business idea

This approach is most appropriate when deciding on starting a business. When there are more than one possible business idea and one needs to decide which one to follow we score business ideas (e.g., BI_1, BI_2, BI_3, BI_4) by assigning a rating from 1 to 3 for each question, with 3 being the strongest. After we score the ideas we sum the total and select the idea with the highest score.

Questions[13]	Scoring business ideas			
	BI_1	BI_2	BI_3	BI_4
Are you familiar with the operations of this type of business?				
Does the business meet your investment goals?				
Does the business meet your income goals?				
Does the business generate sufficient profits?				
Do you feel comfortable with the business?				
Does your family feel comfortable with the business?				
Does the business satisfy your sense of status?				
Is the business compatible with your people skills?				
Is there good growth projected for the overall industry of the business?				
Is the risk factor acceptable?				
Does the business require long hours?				
Is the business location-sensitive?				
Does the business fit your personal goals and objectives?				
Does this business fit your professional skills?				
Totals				

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[13] There are many different questions that can be used for evaluation. Questions in table were taken from www.launchsitesolutions.com/.../docs/g-business/starting-gbusiness/21OpportunityEvaluationChecklist.xls

5.5.2 Evaluating an idea for a business or product

Princeton Creative Research[14] has developed a criteria checklist for evaluating ideas for a business or a product. Entrepreneur or managers in a company should ask a series of questions to find out whether the idea is plausible.

Criteria Questions	Answers – Arguments
Have you considered all the advantages or benefits of the idea? Is there a real need for it?	
Have you pinpointed the exact problems or difficulties your idea is expected to solve?	
Is your idea an original, new concept, or is it a new combination or adaptation?	
What immediate or short-range gains or results can be anticipated? Are the projected returns adequate? Are the risk factors acceptable?	
What long-range benefits can be anticipated?	
Have you checked the idea for faults or limitations?	
Are there any problems the idea might create? What are the changes involved?	
How simple or complex is going to be the idea's execution or implementation?	
Could you work out several variations of the idea? Could you offer alternative ideas?	
Does your idea have a natural sales appeal? Is the market ready for it? Can customers afford it? Will they buy it? Is there a timing factor?	
What, if anything, is your competition doing in this area? Can your company be competitive?	
Have you considered the possibility of user resistance or difficulties?	
Does your idea fill a real need, or does the need have to be created through promotional and advertising efforts?	
How soon could the idea be put into operation?	

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[14] http://www.entrepreneur.com/encyclopedia/checklists/article81940.html

5.5.3 Evaluating new product idea

When there is an idea for developing a new product or service decision makers should thoroughly evaluate the invention and find out what are the chances for success. They can use *21-Point Invention Evaluation Checklist* [15] listed below.

Criteria	Compliance with Criteria
General Criteria	
Is your idea legal?	
What is its environmental impact?	
Is it safe?	
Is it high quality?	
Will it have wide social acceptance?	
Will it have any negative impact?	
Industry Criteria	
Who is your competition?	
Does your product require the assistance of existing products?	
Is there just one product or a line of products?	
Will pricing be competitive?	
Market Criteria	
Does your idea fit into a trend?	
Is there a need for it?	
Is it seasonal?	
Is it a fad, or does it have long-term value?	
Who will buy it?	
Does it need instructions?	
Product Criteria	
How much will it cost to get your idea to market?	
Does it require service or maintenance?	
Is there a warranty?	
Does it need packaging?	
Is it the simplest and most attractive it can be?	

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[15] http://www.entrepreneur.com/encyclopedia/checklists/article81922.html

As already mentioned there are many methods available for evaluating business ideas and business opportunities. It is very easy to create your own list of questions and criteria suitable for your company and your type of business. There are many internet sites (such as http://www.entrepreneur.com,
http://www.sba.gov/,
http://www.kauffman.org/) with detailed information, educational materials and software suitable for such tasks.

5.6 Consensus mapping

This method is aimed at reaching consensus of a group about particular activities which need to be performed to implement an idea. It is quite sophisticated method which requires preparation in advance. It is typical group technique which is very useful for project planning.

The leader of the method presents ideas and for every idea all needed activities are collected with brainstorming. Every participant writes down all activities. Then leader forms groups with 5 to 9 individuals. Every group clusters ideas into related groups or clusters. Every cluster needs to be described by tasks needed to be performed. Those task groups are clustered again with other groups' tasks. After that follows re-assessment of original ideas. The leader consolidates all ideas and tasks into overall cluster map, which contains all ideas, tasks and their relationships, and present it to all participants. Groups are made again to develop its own map of clusters with related tasks. Each group represents its own map to other groups.

It is very complex method which requires pre-training of leader, critical number of participants and enough time to perform it suitably.

5.7 Cost-benefit analysis

Cost-benefit analysis is widely used and relatively simple tool for deciding whether to make a change or not. The quality of decision depends on depth of analysis of benefits and costs connected with idea.

This analysis can be carried out using only financial costs and financial benefits. However, it could include also some intangible items. If this is the case it should be understood that intangible, nonfinancial items could bring a lot of subjectivity into the analysis.

Cost-benefit analysis finds, quantifies, and adds all the positive and negative factors. First ones are the benefits. Then it identifies, quantifies, and subtracts all the negatives, the costs. The difference between the two indicates whether the planned action is advisable. The real challenge is to include all the costs and all the benefits and properly quantify them.

It is very often based on financial data and relatively simple to use while it enables different levels of sophistication. However, it is mainly business oriented and individual technique. Additionally, it is applicable in later phases when limited numbers of ideas were already pre-selected.

The method is usually run in three steps:
1. Definition of all elements causing costs of idea implementation (includes if possible direct, indirect, financial and social costs).
2. Definition of all elements causing benefits of idea implementation (includes if possible direct, indirect, financial and social benefits).
3. Comparison of sum of all costs with the sum of all benefits.

5.8   Decision trees

Decision tree is a decision support tool that uses a graph or model of decisions and their possible consequences, including chance event outcomes, resource costs, and utility. Method could be used in different areas. It is individual technique which enables detailed insight into decision making process. It is appropriate for complex problems solving.

Method is used to identify the strategy most likely to reach a goal. Another use of trees is as a descriptive means for calculating conditional probabilities.

Decision trees are useful tools which help to choose between several courses of action. In decision analysis, a "decision tree" — and a closely related model form, an influence diagram — is used as a visual and analytical decision support tool, where the expected values (or expected utility) of competing alternatives are calculated. Decision trees have traditionally been created manually (e.g. on a wall).

The decision tree can be used as a model to explain the complexity inherent in planning, prediction and strategic thought. It could be used also to map future possibilities and alternatives.

Decision tree is started with a decision that needs to be made. It should be written in a small square on a left side of a large paper. From this box drawn out are lines towards the right for each possible solution, and written a short description of the solution along the line. At the end of each line, considered are results. If the result of taking that decision is uncertain, draw a small circle. If the result is another decision that needs to made, another square should be drawn. Squares represent decisions, and circles represent uncertain outcomes. Written has to be decision or factor above the square or circle. If the solution is completed it is kept blank.

Simple sample of decision tree is shown below. In the second stage every result could be evaluated by its probability to succeed or by financial sources.
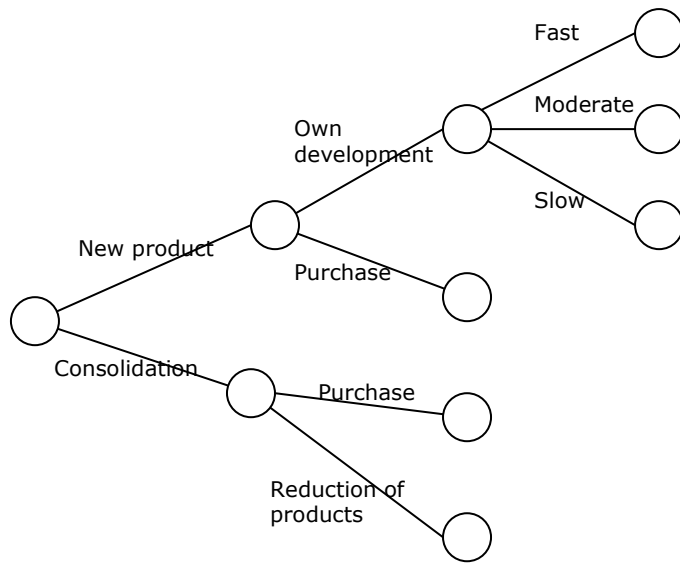
Similar method is influence diagram while both of them are used to visualize and analyze decisions, where the expected values of competing alternatives are calculated.

5.9   Delphi technique

Delphi is a very complex group method. It is systematic forecasting method which depends on opinions of independent experts.

The evaluation matrix requires detailed preparation of the technique leader. In the preparation phase experts have to be carefully selected and the questionnaire has to be prepared. Those experts answer pre-prepared questionnaires in more rounds. After each round leader provides an anonymous summary of the experts' forecasts and the reasons they provided for their judgments. In the next round experts revise their previous answers in accordance to summary forecasts. The aim of repeating judgments is to decrease range of answers and a group will finally find the most appropriate answers.

The process is stopped after a pre-defined stop criterion (e.g. number of rounds, achievement of consensus, and stability of results) and the mean or median scores of the final rounds determine the results. Quality of results depends on competencies of experts and their compatibility.

A method similar to Delphi is Consensus mapping.

5.10 Evaluation matrix

Evaluation matrix can be found under many different names, such us decision matrix, grid analysis, AHP matrix, bid decision matrix, comparison matrix, decision alternative matrix, importance vs. performance matrix, measured criteria technique, opportunity analysis, performance matrix, rating grid, scoring matrix, vendor comparison, weighted criteria matrix, cost-benefit matrix, options/criteria matrix.

The main aim of evaluation matrix is to evaluate an idea in accordance to several factors or criteria. It is applicable when considering more characteristics or criteria of an idea. Evaluation matrix has many application possibilities in different areas. However, to use it efficiently must the scoring criteria must be carefully selected. It is individual or group technique which enables more detailed analysis of vital factors.

It is used to select the best one out of potentially viable ideas. However, it is also appropriate for problem solving. The evaluation matrix allows to quickly sort through options by identifying their relative strengths and weaknesses.

Evaluation matrix allows decision makers to structure and then solve their problem by:
1. specifying and prioritizing their needs in accordance with a listed criteria,
2. evaluating, rating, and comparing different solutions,
3. Selecting the best matching solution.

Evaluation matrix is basically an array presenting on one axis a list of alternatives, also called options or solutions that are evaluated regarding, on the other axis, a list of criteria, which are weighted dependently of their respective importance in the final decision to be taken. The decision matrix is, therefore, a variation of the 2-dimension matrix.

In the matrix below there are three criteria *C1*, *C2* and *C3* playing role in final decision with respective weights. On other side there are three alternatives, named Options *A*, *B* and *C*.

Let us say that we have identified criteria *C1*, *C2*, and *C3* playing a role in the final decision, with a respective weight of 1, 2, and 3. Moreover, we've found 3 prospective providers *A*, *B*, and *C*, whose offer may constitute a good solution. Rates should be on ratio scale, e.g. 0-5, 0-10, or 0-100. After rating all alternatives scores are computed as follows:

Score = **Rating** x **Weight**

At the end the end total score is computed as:
Total Score = **SUM (Scores)**

Criteria	Weight	Alternatives					
		Option A		Option B		Option C	
		Rating	Score	Rating	Score	Rating	Score
C1							
C2							
C3							
Total							

It is to stress that number of criteria and options should be adjusted according to individual ideas and their complexity.

5.11 FMEA - Failure Modes and Effects Analysis

FMEA method is mainly used in the area of design and product development; therefore it is not generally appropriate for every idea selection. Additionally, it is a very complex method. The purpose of the FMEA is to take actions to eliminate or reduce failures, starting with the highest-priority ones. It may be used to evaluate risk management priorities for mitigating known threat-vulnerabilities.

In FMEA, failures are prioritized according to three dimensions:
(1) how serious their consequences are,
(2) how frequently they occur and
(3) how easily they can be detected.

FMEA also documents current knowledge and actions about the risks of failures, and is very useful in continuous improvement processes.

In design stage it is employed to avoid future failures. Later it is used for process control, before and during ongoing operation of the process. It is a methodology for analyzing potential reliability problems early in the development cycle where it is easier to take actions to overcome these issues, thereby enhancing reliability through design.

The method is mainly used to identify potential failure modes, determine their effect on the operation of the product, and identify actions to mitigate the failures. A crucial step is anticipating what might go wrong with a product. While anticipating every failure mode is not possible, the development team should formulate as extensive a list of potential failure modes as possible.

Similar methods are FMECA – Failure Modes, Effects and Criticality Analysis, and RPN – Risk priority numbers which is a part of FMEA.

5.12 Force field analysis

Force field analysis is a group technique, which is very useful for checking the feasibility of idea implementation. It is simple to use. Its' weakness is that it is subjective and opinion based. Force field analysis is a handy technique for looking at all the forces for and against a decision. Therefore, similar method is *weighing pros and cons*.

The recommended approach to this method is to outline the points involved in problematic situations at the problem exploration stage, followed by recognizing factors likely to help or hinder at the action planning and implementation stages.

The process is as follows:
1. Members of the group identify and list the driving and restraining forces (perhaps using a suitable brainstorming or brain-writing technique) openly discussing their understanding of them.
2. The group leader is representative of the current position as a horizontal line across the middle of the page. The leader will draw all the driving forces as arrows that either pull or push the line upwards, and all the restraining forces as arrows that pull or push the line downwards. Where driving and restraining are paired use arrow thickness to signify strength of impact of a force and arrow length to show how complicated it would be to adapt. It is normally best for the team to reach agreement on these details.
3. The diagram should then be used to find as many possible combinations of moving the centre line in the desired direction.

Simple table that could be used in analysis is presented below.

Forces against change	Score

Change proposal

Forces for change	Score

5.13 Grid analysis

Grid analysis is very similar method to evaluation matrix. It is used when considering many different factors and alternatives of an idea. It could be used in group or individually and has many application possibilities in different areas.

This analysis could be performed by identical table as evaluation matrix. In rows on a table written are options and the factors to consider as columns. Each option-factor is scored, weighted and summarized to get overall score of each option.

Similar methods are decision matrix analysis, evaluation matrix, Pugh matrix analysis, MAUT - Multi-attribute utility theory, MCDA - Multiple criteria decision analysis.

For the sample of grid analysis matrix look at the evaluation matrix.

5.14 Idea advocate

This is a group method, applicable after a certain idea has already been selected. As such it is not applicable for use when there are still many ideas to select from. It is similar to business case approach and is a simplified form of the dialectical approach.

The idea of this method is that the idea advocate represents different ideas to the group; therefore the advocate has to know ideas very well. Because an advocate is assigned to every attribute, the positive aspects of the entire attribute will be brought out of group examination.

The idea advocate presents a case for each idea. The advocate should be someone familiar with the idea, or who initiated it, or who would have to implement it. Each idea is then discussed and decisions are made. If a particular case was illuminating then a straightforward selection can be made, however, if there are several strong cases several rounds of elimination will need to take place.

It is important to ensure that there are no differences in power and status amongst the idea advocates. Providing that, the selection of idea will depends on the power of arguments and rhetoric of idea advocate, and not of power distribution within group.

5.15 Impact analysis

This is a group method which is very useful for checking the feasibility of idea implementation. It could be employed on different levels of idea selection process. Method is simple to use but is subjective and based on participants' opinions.

It is a brainstorming method that helps to think about the impacts of particular changes resulted from the idea implementation. Its main contribution is to spot problems before they arise. It focuses on identifying contributing factors to the impact of solution, assuring that all effects are identified, and problems less likely to occur. It also allows visual identification of possible effects before they arise.

Similar methods are descriptive analysis, positive impact analysis and business impact analysis. Further development of this method is *Impact-value analysis*, which forms matrix as shown below. In rows are several impacts e.g. relationship, time, distance, and in columns several values, e.g. innovation, effectiveness, efficiency.

|		Value		
		Innovation	Effectiveness	Efficiency
Impact	Relationship			
	Time			
	Distance			

5.16 Kano model

Kano model is analysis of customers' preferences. As such it is very focused and appropriate in the product development phase. However, it could be also be employed in: identifying customer needs, determining functional requirements, concept development and analyzing competitive products. It could be performed in group or individually, but is not useful for general idea selection.

Kano model is a useful technique for deciding which features you want to include in a product or service and which attributes products should have. It helps to break away from a profit-minimizing mindset that says you've got to have as many features as possible in a product, and helps to think more subtly about the features to include.

The model divides product attributes into three categories: threshold, performance, and excitement. A competitive product meets basic attributes, maximizes performances attributes, and includes as many "excitement" attributes as possible at a cost the market can bear.
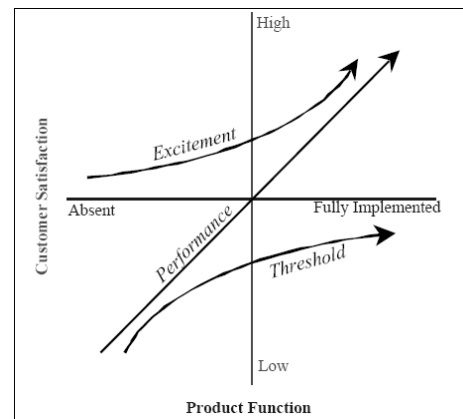
In its basic use it could be performed by asking customers two simple questions for each attribute:
1. Rate your satisfaction if the product has this attribute?; and
2. Rate your satisfaction if the product did not have this attribute?

Customers should be asked to answer with one of the following responses: (1) satisfied, (2) neutral, (3) dissatisfied, and (4) don't care. The information obtained from the analysis, provides valuable input for the Quality Function Deployment process.

5.17 Kepner Tregoe matrix

Kepner Tregoe matrix is meant for decision making and is a structured methodology for gathering information and prioritizing and evaluating it. It is very detailed and complex method applicable in many areas, which is much broader than just idea selection. It is called also a root cause analysis and decision-making method. It is a step-by-step approach for systematically solving problems, making decisions, and analyzing potential risks.

Its aim is to maximize critical thinking skills, systematically organize and prioritize information, set objectives, evaluate alternatives, and analyze impact with high level of objectivity.

The Kepner Tregoe analysis is performed in following steps:
1. prepare decision statement with desired result and required action
2. define strategic requirements, operational objectives and limits
3. rank objectives from the most to the least important and weighting them (e.g. from 1 to 10) in table
4. generate list of alternative courses of action and keep only those that are obligatory of desired result (all other should be eliminated)
5. score alternatives against each objective on a scale of 1 to 10,
6. multiply the weight of the objective by the satisfaction score to come up with the weighted score
7. steps 5 and 6 has to be repeated for each alternative
8. choose the top three alternatives and consider potential problems or negative effects of each one
9. consider each alternative against all of the negative effects,
10. rate chosen alternatives against adverse effects, and score them for probability and significance

During the analysis we form two matrices for each alternative:
- matrix for total weighted score, and
- matrix for adversity rating.

Weighted score Matrix

Objective	Weight	Alternative 1 satisfaction score	Weighted score (weight x score)

Adversity rating Matrix

Adverse effect	Probability	Significance	Weighted score (probab. X sign.)

Methods similar to Kepner Tregoe analysis are Efficiency analysis and Analytic Hierarchy Process.

5.18 NAF – Novelty, Attractiveness, Feasibility study

This method is a quick and easy way of assessing new ideas for three issues: novelty, appeal and practicality. Method is especially appropriate before further development of idea. The method is applicable individually or in group and in many different areas. As it is simple to use, is appropriate for early phases in idea selection process. Its main contribution is to rank ideas. Similar method is value analysis.

By its application each item should be scored of 1 to 10 for three items:
1. Novelty - How novel is the idea? If it isn't novel for this situation, it probably isn't very creative
2. Attractiveness - How attractive is this as a solution? Does it completely solve the problem? Or is it only a partial solution?
3. Feasibility - How feasibly is it to put this into practice? It may have been a really attractive solution to use a time machine, but is it really feasible?

All three scores are summarized and then ideas are ranked.

Ideas	Novelty (1)	Attractiveness (2)	Feasibility (3)	Total (1+2+3)
Idea 1				
Idea 2				
Idea 3				
Idea x				

5.19 Nominal group technique

The Nominal group technique provides a structured method of collecting and organizing the thoughts of a group. It is a structured from of brainstorming or brain-writing methods, with up to 10 participants and an experienced leader.

The method gathers information by asking participants to respond to questions, and then asking participants to prioritize the ideas or suggestions of all group members. The process prevents the domination of single person, encourages all group members to participate, and results in a set of prioritized solutions or recommendations that represent the group's preferences.

The method is used in following steps:
1. Anonymous generation of ideas in writing begins with the leader stating the problem and giving the participants up to 10 minutes to jot down any initial ideas privately. The leader also writes down own ideas.
2. Afterwards each participant read out one idea, which the leader writes up on a flip chart for all to view and numbered sequentially. This is repeatedly going around the groups until all ideas are exhausted and any duplicates are eliminated.
3. Serial discussion to clarify ideas and check communication is encouraged by the leader. Working through each idea systematically asking for questions or comments with a view to developing a shared understanding of an idea. Discussions are controlled to aid clarification of the idea, they are not heated debates
4. Preliminary anonymous vote on item importance is usually carried out.
5. Further discussion and voting takes place, if the voting is not consistent. Steps 3 – 4 can be repeated and any ideas that received votes will be re-discussed for clarification.

Although it is a subjective, opinion based method, it is useful for prioritization of ideas. Additionally, method has many application

possibilities in different areas. As such it is appropriate for early phases in idea selection process.

5.20 Paired comparison analysis

In paired comparison analysis a range of options are compared and the results are tallied to find an overall winner.

To employ the method, a range of plausible options is listed. Each option is compared against each of the other options, determining the preferred option in each case. The results are tallied and the option with the highest score is the preferred option. The matrix is similar to correlation matrix.

This method may be conducted individually or in groups. It may include criteria to guide the comparisons or be based on intuition following an open discussion of the group. A paired choice matrix or paired comparison matrix can be constructed to help with this type of analysis. Simple case is shown below in matrix. In each pair the preferred fruit is signed and it is scored by a level of preference.

	(A) Apple	(O) Orange	(M) Melon	Total
(A) Apple				Apple has 2 points
(O) Orange	O 3			Orange has 3 points
(M) Melon	A 2	M 4		Melon has 4 points

5.21 Pareto analysis

Pareto Analysis is often simply stated as **20:80 rule**. It is a simple technique that helps to identify the most important problems to solve. Method has many application possibilities in different areas and could be conducted individually or in group. Pareto analysis is a formal technique for finding the changes that will give the biggest benefits. It is useful in cases where many possible courses of action are competing for our attention. Similar method to Pareto analysis is ABC analysis.

This principle can be applied to quality improvement to the extent that a great majority of problems (80%) are produced by a few key causes (20%). Or in terms of quality improvement, a large majority of problems (80%) are produced by a few key causes (20%).

Pareto analysis is simple to use:
- Listing all relevant problems and available options
- Grouping options that are solving the same larger problem
- Applying an appropriate score to each group
- Working on the group with the highest score

Pareto analysis shows the most important issues to be taken care of and at the same time gives a score showing how important the issue is.

5.22 PMI analysis

The basic idea behind the method is to find positive, negative and interesting points of an idea. It is improvement to the "weighing pros and cons" technique.

This method could be used in any stage of idea and product development, but is the most appropriate for idea screening. It could be individual or group technique.

For implementing the technique, needed a list of paper is with three columns headed: plus, minus and interesting, as shown below.

Plus	Minus	Interesting
Sum of scores +	*Sum of scores -*	*Sum of scores + or -*

In the column *Plus* write down all positive effects of implementing the idea, in *Minus* all possible negative effects, and in *Interesting* what is interesting about the idea. Every effect needs to be scored (it is quite subjective decision). Plus effects could have only (+) scores, negative only (−) scores, while interesting scores could have (+) and (−) scores. At the end all scores are summarized.

Additionally, if the method is implemented in group, all positive, negative and interesting effects could be listed in one table and summarized again.

Very positive score shows that the idea could be implemented and very negative score that it should be abandoned.

5.23 Prioritization

After the evaluation of several ideas, they have to be settled in accordance to their importance for the selection team, what could be called prioritization of ideas. Prioritization contains different methods which help to evaluate and prioritizes ideas in evaluation process. Below, two possible combinations of appropriate methods which could be used in prioritization are listed and shortly described.

The first approach is to use a group of methods that contains Multi-voting, Criteria matrix or evaluation matrix, Criteria matrix selection, Decision grid or grid analysis, Idea ranking and Final selection (force field analysis):

- **Multi-voting:** Team members "vote" on the ideas they like the best; those ideas that receive multiple votes are considered to be the most promising ones.
- **Criteria matrix or evaluation matrix** The facilitator uses this method to develop criteria for evaluating ideas, and can assign weights to each one. This value is then multiplied by the numerical value that team members give to each idea to calculate a weighted score for each idea and criterion.
- **Criteria matrix selection:** The team then selects the ideas it believes are most valuable using a checkmark system in accordance to scores in evaluation matrix.
- **Decision grid or grid analysis:** This method is used to assign 2 criteria with scales of 0 to 10 corresponding to the range of possible weights for each idea. Those ideas that score the highest will naturally be positioned in quadrant 1, the upper right-hand quadrant (scoring high on both scales).
- **Idea ranking:** The facilitator has a list of ideas and ranks them from most important to least important. For example, if you have a list of six ideas, each team member would rank them from 1 to 6 (each number can only be used once). This method helps teams to develop a more finite ranking of ideas than a "yes/no" vote.
- **Final selection (force field analysis):** In this phase, team members are asked to consider each idea in terms of its feasibility. This is measured by putting each idea through what is called a

"force field analysis." This evaluation technique helps to identify the driving forces, which complement the execution of an idea, and the restraining forces, which may hinder the implementation of an idea. The force field analysis appears as a grid, with columns where you can identify the drivers and restraining forces for that idea, and assign each one a weight. This dialog box also contains a "feasible" checkbox where you can designate an idea as feasible, if its driving forces outweigh its restraining forces.

While these simple approaches to prioritization suit many situations, there are plenty of special cases where you'll need other tools if you're going to be truly effective. So the second possibility is to employ Paired Comparison Analysis, Grid Analysis, The Action Priority Matrix, The Urgent/Important Matrix, The Ansoff & Boston Matrices, Pareto Analysis and Nominal Group Technique:

- **Paired Comparison Analysis:** Paired Comparison Analysis is most useful where decision criteria are vague, subjective or inconsistent. It helps you prioritize options by asking you to compare each item on a list with all other items on the list individually. By deciding in each case which of the two is most important, you can consolidate results to get a prioritized list.
- **Grid Analysis:** Grid Analysis helps you prioritize a list of tasks where you need to take many different factors into consideration.
- **The Action Priority Matrix:** This quick and simple diagramming technique asks you to plot the value of the task against the effort it will consume. By doing this you can quickly spot the "quick wins" which will give you the greatest rewards in the shortest possible time, and avoid the "hard slogs" which soak up time for little eventual reward. This is an ingenious approach for making highly efficient prioritization decisions.
- **The Urgent/Important Matrix:** Similar to the Action Priority Matrix, this technique asks you to think about whether tasks are urgent or important. Frequently, seemingly urgent tasks actually aren't that important. And often, really important activities (like working towards your life goals) just aren't that urgent.
- **The Ansoff & Boston Matrices:** These give you quick "rules of thumb" for prioritizing the opportunities open to you. The Ansoff

Matrix helps you evaluate and prioritize opportunities by risk. The Boston Matrix does a similar job, helping you prioritize opportunities based on the attractiveness of a market and your ability to take advantage of it.

- **Pareto Analysis:** Where you're facing a flurry of problems needing to be solved, Pareto Analysis helps you identify the most important changes to make. It firstly asks you to group together the different types of problem you face, and then asks you to count the number of cases of each type of problem. By prioritizing the most common type of problem, you can focus your efforts on resolving it. This clears time to focus on the next set of problems, and so on.

- **Nominal Group Technique:** Nominal Group Technique is a useful technique for prioritizing issues and projects within a group, giving everyone fair input into the prioritization process. This is particularly useful where consensus is important, and where a robust group decision needs to be made. Using this tool, each group participant "nominates" his or her priority issues, and then ranks them on a scale, of say 1 to 10. The score for each issue is then added up, with issues then prioritized based on scores. The obvious fairness of this approach makes it particularly useful where prioritization is based on subjective criteria, and where people's "buy in" to the prioritization decision is needed

5.24 Repeatable questions diagrams

Repeatable questions diagrams have several names, such as why/why and how/how diagrams. Similar method is **casual mapping**. All diagrams are subjective and opinions based but are simple to use. As such are appropriate for problem identification and goal setting. They could be applied individually or in group.

All repeatable questions diagrams have the same basic structure. They are performed by repeating questions over and over what generates as much or as little information as the quantity and type of questions demand.

Differentiation between the 2 types of repeatable question (why/why and how/how) gives serial questions, used indefinitely and emptying questions used until the subject concerned is drained.

Those diagrams could be used for:
- Identifying problems that might be having with implementation of idea,
- Identifying possible causes of key outcomes,
- Investigating problems and find a fix,
- Identifying potential new subproblems, solutions and opportunities for idea implementation,
- Defining specific tasks for a goal (either your own, group or company),
- Visualizing all aspects of a problem or goal.

5.25 Sticking dots

Sticking dots is quick method for determining priorities by voting. This is not a deeply analytic method, but a short, sharp measure of the current thinking about the idea. It is a group method, based on opinions. However, it has many application possibilities in different areas and is useful for collection of opinions in early phases in idea selection process.

It has following steps:
- Ideas are itemized clearly on a flip chart (or similar aid).
- Nameless voting tends to work best.
- Give each group a different colour set of dots, (e.g. group A have red dots, group B has blue dots).
- Give each individual or group a number of dots (e.g. 10 each).
- Allow the group time to deliberate over the ideas they wish to vote for.
- Once all the groups are ready, one person from the group sticks their dots by their preferred top ideas.
- In some variations, there is no maximum number of votes an individual / group can give to one idea.
- Once all the dots are placed, all the groups enter into a discussion on any patterns, and general observations.
- At the end a short-list of the top 5 is made.

5.26 SWOT analysis

SWOT analysis stands for Strengths / Weaknesses / Opportunities / Threats and is one of the most known methods. Its aim is to identify key problems and potential development routes.

This analysis is also a vital element in the SMEs business plans. It helps to identify the key forces acting on their market and the influence that they could have on strategic development. SWOT is easy to use, easy to implement and easy to understand. It could be implemented in group or individually on very broad areas of application. As it is mainly used in business area is not very applicable for general idea selection.

Strengths	Weaknesses
Opportunities	Threats

5.27 TRIZ method

TRIZ is a Romanized acronym for Russian "***T**eoriya **R**esheniya **I**zobretatelskikh **Z**adatch"* meaning "The theory of solving inventor's problems" or "The theory of inventor's problem solving".

The TRIZ is very complex method and encompasses a number of different tools and techniques for specific domains, including 40 inventive principles and contradiction tables

Today, TRIZ is a methodology, tool set, knowledge base, and model-based technology for generating innovative ideas and solutions for problem solving.

TRIZ provides tools and methods for use in problem formulation, system analysis, failure analysis, and patterns of system evolution (both 'as-is' and 'could be').

TRIZ, in contrast to techniques such as brainstorming (which is based on random idea generation), aims to create an algorithmic approach to the invention of new systems, and the refinement of old systems.

Actually it is very, very complex methodology comprising many methods and as such it is not very appropriate for idea selection at individual level or in SMEs. However, we are mentioning it because it is a world known method.

5.28 Value analysis

Value analysis could be used for analyzing a product or process, to determine the real value of each component, when looking for cost savings, to determine components that may be optimized, and only when the item to be analyzed can be broken down into subcomponents and realistic costs and values allocated to these.

The method is used to determine and improve the value of a product or process by first understanding the functions of the item and their value, then its constituent components and their associated costs, in order to reduce their costs or increase the functions value.

The basic premise of value analysis is that someone can identify potentials for efficiency gains. A focal point of this process is a series of questions.

A series of possible questions are listed below. Those are general questions which can apply to products, services and processes:

1. Does it contribute value?
2. Are its costs proportionate to its usefulness?
4. Does it have functions that can be divided into sub-functions?
5. Has its requirements changed over time?
6. Does it have all of the needed features?
7. Does it have features that are not needed?
8. Can it be eliminated?
9. Is there a substitute for it?
10. Have subsequent events changed its original purpose?
11. Is its original purpose still relevant?
12. Are its requirements more stringent than currently needed?
13. Is it better done by our organization or by a supplier?
14. Is there a standard part, service, or procedure that can perform its function just as well?
15. Is it overcomplicated?
16. Can minor enhancements improve its performance substantially?

17. Can cost savings be achieved without substantial reductions in effectiveness?
18. Have supplier suggestions been sought?
19. Have user suggestions been sought?

5.29 Vroom-Yetton-Jago contingency model

The idea evaluation process must consider also the implementation phase. There is no use to select good idea which can not be implemented. The Vroom-Yetton-Jago Decision Model [16] provides a useful framework for identifying the best leadership style to implement the idea.

The model differentiates among five different managerial decision styles: two authoritarian (denoted AI and AII); two consultative: consultation with subordinates individually (CI) and consultation with subordinates as a group (CII); and a group decision making (GII). What are the possible actions within this model?

1. **Autocratic I (AI)**: Completely autocratic. Leader solves the problem or makes the decision by himself using the information available to him at the present time.

2. **Autocratic II (AII)**: Request specific information. Leader obtains any necessary information from team members/subordinates, and then decides on the solution to the problem itself. Leader may or may not tell subordinates the purpose of his questions or gives information about the problem or decision he is working on. The input provided by them is in response to his request for special information. They do not play a role in the definition of the problem nor in generating or evaluating alternative solutions.

3. **Consultative I (CI)**: One-on-one discussion. Leader shares the problem with the relevant team members/subordinates individually, getting their ideas and suggestions without bringing them together as a group. Then he makes the decision. This decision may or may not reflect subordinates' influence.

4. **Consultative II (CII)**: Group discussion. Leader shares the problem with team members in a group meeting. In this meeting

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[16] The model was developed by Victor Vroom and Philip Yetton in the book titled *Leadership and Decision Making* in 1973. In 1988, Victor Vroom and Arthur Jago, replaced the decision tree system of the original model with an expert system based on mathematics. The model can be found under different names: Vroom-Yetton-Jago, Vroom-Yetton and Vroom-Jago.

leader obtains their ideas and suggestions. Then he makes the decision which may or may not reflect subordinates' influence.

5. **Group (GII)**: Consensual group decision-making. Leader shares the problem with team members/subordinates as a group. Together they generate and evaluate alternatives and attempt to reach agreement (i.e., consensus) on a solution. Leader's role is much like that of facilitator, coordinating the discussion, keeping it focused on the problem and making sure that the critical issues are discussed. Leader can provide the group with his information or ideas, not trying to "press" them to adopt his solution and is willing to accept and implement any solution which has the support of the entire group.[17]

The Vroom-Yetton-Jago Contingency model is in the shape of a decision tree model in which eight yes/no questions must be answered in order from 1 to 8 when moving across the tree diagram from left to right. Questions are asked to determine the level of quality requirement (QR), commitment requirement (CR), leader's information (LI), problem structure (ST), commitment probability (CP), goal congruence (GC), subordinate conflict (CO) and subordinate information (SI)[18]:

1. **Quality Requirement (QR)**: How important is the technical quality of the decision?
2. **Commitment Requirement (CR)**: How important is subordinate commitment to the decision?
3. **Leader's Information (LI)**: Do you (the leader) have sufficient information to make a high quality decision on your own?
4. **Problem Structure (ST)**: Is the problem well structured (e.g., defined, clear, organized, lend itself to solution, time limited, etc.)?
5. **Commitment Probability (CP)**: If you were to make the decision by yourself, is it reasonably certain that your subordinates would be committed to the decision?
6. **Goal Congruence (GC)**: Do subordinates share the organizational goals to be attained in solving the problem?

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[17] http://www.implementer.com/implementer/web/step4_c/persuade-decrational.htm
[18] http://faculty.css.edu/dswenson/web/LEAD/vroom-yetton.html

7. **Subordinate conflict (CO)**: Is conflict among subordinates over preferred solutions likely?
8. **Subordinate information (SI)**: Do subordinates have sufficient information to make a high quality decision?

The diagram below[19] displays the process of using the Vroom-Yetton-Jago Model which helps us to select the best decision making style when implemented the selected idea. For example: If the quality requirements are low and also the commitment requirements are low then leader solves the problem alone using information that is readily available to him/her. If the quality requirements are low, commitment requirements are high but the probability of commitment is low consensual group decision-making is needed.
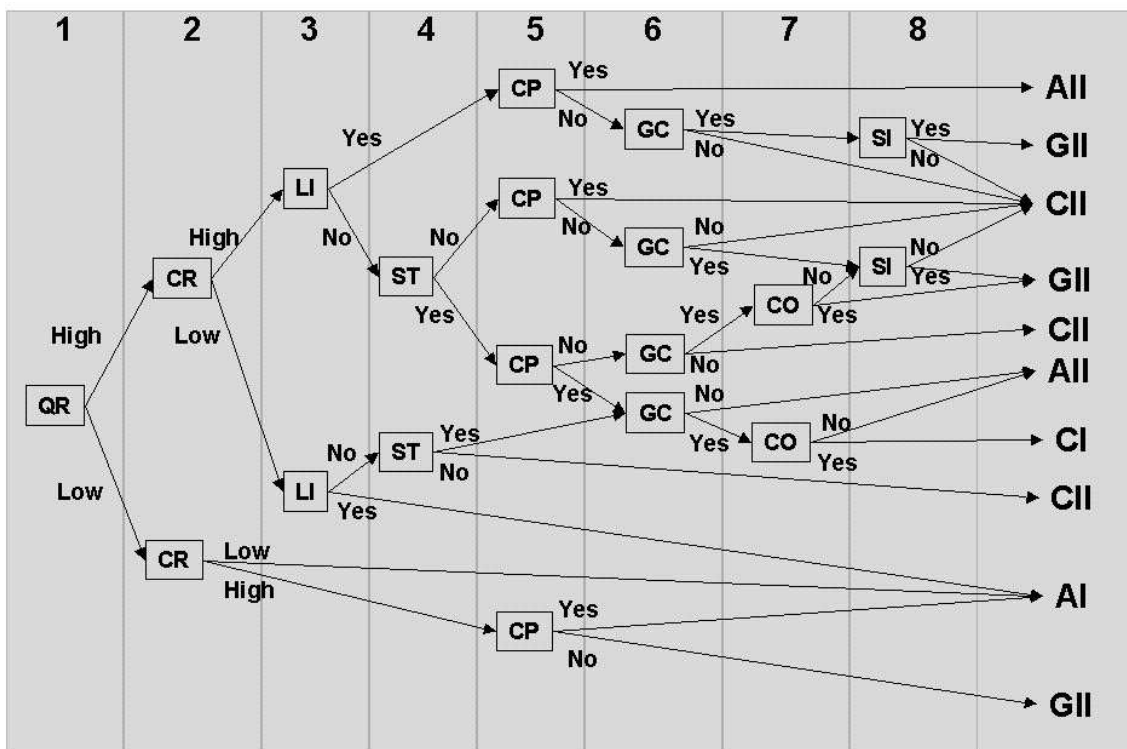
Figure 7: Vroom-Yetton-Jago Model[20]

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[19] http://faculty.css.edu/dswenson/web/LEAD/vroom-yetton.html

[20] Source: http://faculty.css.edu/dswenson/web/LEAD/vroom-yetton.html

The logic of Vroom-Yetton-Jago Model teaches us that you should not make autocratic decisions when team acceptance is crucial for a successful outcome. There is also no use in involving the team in every decision, because of ineffective use of scarce resources. When implementing the selected idea one have to adapt the leadership that will bring the best results.

6. Conclusions

To increase the creativity and innovativeness of companies not only ideas are to be produced, they need to be exploited. In this part of the project *Creative Trainer* we investigated methods and techniques for idea evaluation. We found a broad spectrum of evaluation methods and techniques, applicable in very broad areas of a company life.

There are also many idea evaluation software programs. All of them are of commercial nature and idea evaluation phase is usually only a (minor) part of the features they provide. Therefore they were omitted from our list.

The investigated methods are listed in the table, showing also their key features.

Method (*Similar methods*)	Key features
ABC analysis (*Pareto analysis*)	• Many application possibilities in different areas • Simple to use • Must be careful when setting importance criteria • Individual or group technique
AHP-based approach (*Weighting and rating, Paired comparison analysis*)	• Many application possibilities in different areas • Must be careful weighing • Mainly group technique • Enables detailed insight into decision making process • Appropriate for solving complex problems • Often statistically supported • Computer assisted
Anonymous voting	• Group technique • Appropriate for idea selection • Very subjective methods • Because of anonymity of the method individual criteria for idea ranking are not clear • Appropriate for early phases in idea selection process • Based on opinions

A-T-A-R model	• Especially appropriate in marketing • Individual or group technique • Very focused • Not very useful for general idea selection
Checklists for business idea evaluation	• Individual method • Simple to use at the absic level • Can be computer assisted • Business oriented • Also useful for early stages of business idea selection
Consensus mapping	• Group technique • Not very useful for general idea selection • Very useful for project planning • Complex, requires training • Qualitative
Cost-benefit analysis	• Very often based on financial data • Simple to use • Many possibilities of application • Enables different levels of sophistication • Mainly business oriented • Individual technique • Applicable in later phases when limited number of ideas already pre-selected
Decision trees (Tree diagram, influence diagram)	• Many application possibilities in different areas • Must be careful when assign probabilities • Individual technique • Enables detailed insight into decision making process • Appropriate for solving complex problems • Often statistically supported • Computer assisted
Delphi technique (Consensus mapping)	• Very complex • Group technique • Quality of results depends on competencies of experts and their compatibility • Mainly used as a forecasting method

Evaluation matrix *(Decision matrix, grid analysis, etc)*	• Many application possibilities in different areas • Must be careful when setting scoring criteria • Individual or group technique • Enables more detailed analysis of vital factors
FMEA - Failure Modes and Effects Analysis *(FMECA)*	• Mainly used in area of design and product • development • Not appropriate for single idea selection • Very complex
Force field analysis *(Weighing pros and cons)*	• Group technique • Very useful for checking idea implementation feasibility • Simple to use • Subjective, opinion based
Grid analysis *(Decision matrix analysis)*	• Many application possibilities in different areas • Must be careful when setting scoring criteria • Individual or group technique • Enables more detailed analysis of vital factors
Idea advocate *(Business case approach)*	• Group technique • Applicable after idea already selected • Depends on the power of arguments and rhetoric of idea advocate • Not applicable for use when there are many ideas to select from
Impact analysis *(Descriptive analysis)*	• Group technique • Not very useful for general idea selection • Very useful for checking idea implementation feasibility • Simple to use • Subjective, opinion based
Kano model	• Appropriate for product development phase • Very focused • Group or individual technique • Not very useful for general idea selection • Especially appropriate in marketing

Kepner Tregoe matrix (Efficiency analysis, Analytic hierarchy process)	• Very detailed • Very complex, requires training • Much broader than just idea selection • Applicable in many areas • High level of objectivity
NAF – Novelty Attractiveness Feasibility (Value analysis)	• Many application possibilities in different areas • Simple to use • Individual or group technique • Appropriate for early phases in idea selection process • Useful for ranking ideas
Nominal group technique	• Group technique • Subjective, based on opinions • Useful for prioritization of ideas • Many application possibilities in different areas • Appropriate for early phases in idea selection process
Paired comparison analysis (Paired choice analysis)	• Individual or group technique • Many application possibilities in different areas • Appropriate for early phases in idea selection process • Must be careful when setting weighing criteria
Pareto analysis (ABC analysis)	• Many application possibilities in different areas • Simple to use • Must be careful when setting importance criteria • Individual or group technique • Enables more detailed analysis of vital factors
PMI analysis (Weighing pros and cons)	• Many application possibilities in different areas • Simple to use • Individual or group technique • Appropriate for early phases in idea selection process
Prioritization	• Group technique • Applicable in first phases of idea selection • Computer assisted • Use of different methods in appropriate sequence

Repeatable questions diagrams *(Causal mapping)*	- Subjective, opinion based - Individual or group technique - Simple to use - Appropriate for problem identification and goal setting
Sticking dots	- Group technique - Based on opinions - Prioritization method - Danger of biased "go with the flow" opinions - Many application possibilities in different areas - Useful for collection of opinions - Appropriate for early phases in idea selection process
SWOT analysis	- Individual or group technique - Very broad areas of application - Not very applicable for general idea selection - Easy to use - Mainly used in business field
TRIZ	- Very complex, requires training - Many possible application - Contains many other methods and tools
Value analysis (NAF)	- Group or individual technique - Applicable in later stages of produc development - Arose of new ideas - Costumer oriented
Vroom-Yetton-Jago Normative Decision Model	- Individual technique - Very useful for checking idea implementation feasibility - Draw attention to the context of idea implementation - Qualitative, opinion based

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