Jerzy Michnik
Maciej Nowak
Department of Operations Research
University of Economics in Katowice

INTERACTIVE DECISION AIDING TECHNIQUE FOR A NEW PRODUCT SELECTION PROBLEM[1]

Introduction

The selection of new product projects is a part of continuous process and plays the crucial role in the new product development (Cooper 2004a, 2004b). Academic and industry participants which took part in the extended survey indicated ”new product project selection” as belonging to the most important among top 24 technology management issues (second place after the 'strategic planning for technology products') (Scott 2000). Yet, despite the critical role of innovation management and the abundance of literature discussing the role of new product development, there are not many articles discussing the MCDA models (Michnik 2011).

We assume that the firm has definite portfolio of its products and periodically reviews some new potential products to select the new one. The new project may be added to the existed portfolio or may replace the obsolete one. Such kind of a decision is characterized by many discordant objectives. These objectives are linked to a majority of firm's activities and external environment. According to the classification published in (Michnik 2010), we propose five general categories of criteria:

- strategic criteria, designed to represent the strategic plans and long term goals,
- organizational criteria comprising organizational, marketing, logistic and other similar competencies,
- technological criteria, connected with R&D potential and technological competencies,
- financial criteria representing investment costs and potential revenues,

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- market criteria encompassing the broad range of market factors, including customers' and competitors' reaction to a new product.

The remaining part of the paper is organized as follows. The next section contains a brief review of multiple criteria models used in the NPD. In Section 2 the interactive approach to multicriteria discrete problem is presented. Using a numerical example, we illustrate in Section 3 how the procedure works. Conclusions are placed at the end of the paper.

1. Multicriteria decision methods in NPD

Englund and Graham (1999) discussed practices for upper manager teamwork and offer a complete model for selecting projects that support a strategic emphasis. AHP (Saaty 2005) was the last stage of a multi-stage process and include the following criteria:

- customer satisfaction,
- employee satisfaction,
- business value,
- the effectiveness of the process.

Each of these criteria was divided into 3 to 5 lower-level criteria. The structure of the criteria and sub-criteria was the result of the work of a team of experts. The model was successfully employed within Hewlett-Packard Company.

AHP method was also an essential part of the selection process of new products in a large division of the US company (Calantone et al. 1999). Similarly to the previous example, the team developed a set covering four criteria:

- matching the core competencies of marketing,
- matching the basic technological skills,
- profit-risk profile (in terms of money),
- the overall uncertainty of the results of the project.

The first two criteria are divided into 6 sub-criteria, and the last two into 2. The authors concluded that the presented model of AHP can be used as a standalone tool or can be integrated into a more comprehensive decision support system.

For analysis, ranking and selection of the R&D projects in the Advanced Technology Division (Bell Laboratories) the multicriteria model combined with a graphical decision support system was used (Linton et al. 2000). That model was the initial stage of the decision support system, served for the initial selection of projects that had the greatest potential. The criteria were selected by managers and project managers, and were divided into two groups:

– quantitative criteria (financial), including the amount of investment and the expected cash flows in the forthcoming years;
– qualitative criteria, including the assessment of the two stages: the product life cycle and the life cycle of the intellectual property.

Another example is the model based on multicriteria method SMART (Simple Multi-Attribute Rating Technique) developed in the 70's of the last century (Edwards 1971, 1977). This model has been applied in the international production company (Morcos, 2008). Project evaluation was based on the confrontation of resource usage and potential benefits. In order to simplify the model, resource assessment has been limited to financial resources, and the benefits have been divided into tangible and intangible ones. The short term profitability has been adopted as an tangible benefit. Intangible benefits include two items: reliability (increasing the reliability of projects) and risk (minimizing the risk of portfolio of projects). The partial aggregation of ratings has been made during the procedure, so that, finally, the model had only two criteria. That allowed a simplified analysis and a graphical presentation of the location of the variants in the two-dimensional graph.

The NPD is a special case of the project selection problem, which has been extensively analyzed for the last decades. Due to the complexity of the problem, metaheuristics are often used. Doerner et al. (2006) use ant colony with integer linear programming preprocessing to identify Pareto-optimal portfolios. The model proposed by Carazo et al. (2010) assumes strong interdependence between projects. As a result, projects have to be assessed in groups, while allowing individual projects to start at different times depending on resource availability or any other strategic or political requirements, which involves timing issues. The problem is solved using a metaheuristic procedure based on Scatter Search.

2. Interactive approach for solving multicriteria decision making problems

The problem we consider here is a discrete multi-criteria decision-making problem. We assume that the decision maker (DM) goal is to select the single alternative that maximizes his/her satisfaction, all criteria are maximized and outcomes are measured in real values (ratio scale is used for each criterion).

Let us assume the following notation:

A – the finite set of alternatives a_i, $i = 1, \ldots, m$,

F – the finite set of criteria f_p, $p = 1, \ldots, r$,

V – the set of evaluations of alternatives with respect to criteria v_{ip}, $i = 1, \ldots, m$, $p = 1, \ldots, r$.

In order to solve a multicriteria problem, single-criterion evaluations must be aggregated. Roy (1985) identified three main aggregating concepts: a concept with a single synthetic criterion, outranking concept, and dialog concept with “trial-and-error” iterations. The last idea, also known as “interactive approach”, is often used for solving real-world problems.

Interactive methods employ two main paradigms for identifying decision-maker’s preferences: direct and indirect. In the prior one, the decision maker expresses his/her preferences in relation to the values of criteria. Indirect collection of preferences means that the decision-maker is asked to analyze trade-offs among criteria at each iteration, given the current candidate solution. Methods combining these two approaches are also proposed.

Initially, interactive techniques were dedicated mainly for multi-criteria linear programming problems. Benayoun et al. (1971) used the concept of ideal solution and proposed STEM method in which a single candidate solution was presented to the decision-maker in each iteration. If the proposal was not satisfactory, the decision-maker was asked to define the amounts of relaxation for the criteria, whose values were already satisfactory and new candidate was generated. While STEM uses direct way of collecting preference information, the method proposed by Geoffrion et al. (1972) analyzes trade-offs. This approach was also adopted by Dyer (1972) for the one-sided goal programming model. In other methods the decision maker has to specify an interval for each local trade-off ratio (e.g. Salo and Hämäläinen, 1992) or comparative trade-off ratios (e.g. Kaliszewski, Michałowski, 1997).

Methods that construct and optimize a so-called achievement scalarizing function are also very popular (Wierzbicki 1980; Miettinen 1999). This function is used to minimize the distance from the reference point to the feasible region, if the reference point is unattainable, or to maximize the distance otherwise (Miettinen 1999; Ruiz et al. 2008; Luque et al. 2009; Nikulin et al. 2012).

Techniques combining various approaches are also suggested. Kaliszewski and Michalowski (1999) proposed NIDMA procedure, that allowed the decision maker to use different search principles depending on his/her perception of the achieved values of criteria and trade-offs.

Although the procedures mentioned above are dedicated mainly to continuous problems, some of them can also be adapted to the problems with a finite number of alternatives. However, some specific features of such problems make it worthwhile to try to propose techniques dedicated to them. It was observed, that the decision-maker faced with a discrete decision-making problem evaluates an alternative comparing it with other ones (Roy, 1985). Thus, a variety of methods based on pairwise comparisons were proposed, such as AHP, Electre, Promethee and others (see e.g. Figueira et al. 2005).

Most of this methods assume that the preference collection phase precedes the computation phase during which the final solution is identified. Nevertheless, interactive methods were also used, e.g. when risk is taken into account (see e.g. Nowak 2006, 2007, 2011).

2.1 Point-to-point trade-offs and global trade-offs

The term "trade-off" is widely used in economics. In the decision analysis context it is usually interpreted as a ratio that specifies the amount by which the value of one criterion increases while that of the other one decreases when a particular solution is replaced by another given solution. Following Kaliszewski and Michalowski (1999) we will use the term "point-to-point trade-off" for such ratio.

Assuming that the currently analyzed alternative a_c is to be replaced by a_i, in order to increase the value of criterion f_p at the expense of decreasing value of f_q, a point-to-point trade-off is calculated as follows:

$$t_{ic}^{pq} = \frac{v_{ip} - v_{cp}}{v_{cq} - v_{iq}} \tag{1}$$

Let us assume that the DM analyzes alternative a_c and decides that the evaluation with respect to f_p should be improved, while the evaluation with respect to f_q may be decreased. In such case we will look for alternatives a_i such that $v_{ip} > v_{cp}$ and $v_{iq} \geq v_{cq}$, and choose the one for which the increase of f_p is maximal. If it is not possible to improve f_p without decreasing f_q, the alternative that maximizes point-to-point trade-off may be a good option.

The procedures that use the trade-off information for solving multicriteria linear programming problems usually use "global trade-off" (Kaliszewski; Michalowski 1999). Let us assume that the current solution is a_c. The global trade-off is defined as follows:

$$T_c^{pq} = \max_{k \in \mathbf{Z}_c^q} \frac{v_{kp} - v_{cp}}{v_{cq} - v_{kq}} \tag{2}$$

where: $\mathbf{Z}_c^q = \left\{ k : a_k \in \mathbf{A}, v_{kq} < v_{cq}, v_{kt} \geq v_{ct}, t = 1, \ldots, r, t \neq q \right\}$.

It is also assumed that if $\mathbf{Z}_c^q = \varnothing$, then $T_c^{pq} = -\infty$

A global trade-off for given a_c is calculated as a maximum of all point-to-point trade-offs defined for pairs of solutions (a_c, a_i) such that for all but one criterion a_i has values greater or equal to those for a_c. Thus, a global trade-off specifies the least upper bound on an increase of one criterion value relative to a unit decrease of another criterion value occurring while moving from a particular solution in a direction where all the remaining criteria do not decrease. The global trade-off is used to determine the direction in which the new candidate solution should be searched.

While for continuous problems usually the set $\mathbf{Z}_c^q$ is not empty, for discrete problems it is often difficult to find alternatives for which only one criterion has a worse value than for a_c. As a result analyzing global trade-offs is not effective. In the procedure presented below we propose to use a max-min rule to analyze trade-offs for various pairs of criteria.

2.2 The procedure

The technique we propose here exploits trade-offs between criteria to identify a new candidate for the final solution. The main assumption is that the same scale is used for measuring outcomes with respect to each criterion, e.g. the one in which 0 is the worst evaluation, and 100 – the best one. The same scale keeps balance between the criteria of different nature. It is also wide enough to facilitate a differentiation between decision alternatives. Even if the original data have different scales, a simple transformation can be used to make evaluations comparable. Let $y_{i\,p}$ be the evaluation of alternative a_i with respect to criterion f_p. In such case the following formula can be used for transformation:

$$v_{i\,p} = \frac{y_{i\,p} - \underline{y}_p}{\overline{y}_p - \underline{y}_p} \times 100 \tag{3}$$

where: $\underline{y}_p = \min\limits_{i:a_i \in \mathbf{A}} \{y_{i\,p}\}$, $\overline{y}_p = \max\limits_{i:a_i \in \mathbf{A}} \{y_{i\,p}\}$.

The procedure starts with generating an initial solution. Next, the final solution is searched using the information provided by the decision-maker. For identifying the initial proposal we propose to use Euclidean metric and determine the alternative closest to the ideal solution.

Each iteration of any interactive technique consists of data presentation phase and preference collection phase. In our procedure following data are presented to the decision maker:

– evaluations of candidate alternative a_c,
– potency matrix consisting of two rows – the first one including the worst evaluation of each criterion attainable in the current set of alternatives, and the second including the best ones.

If the decision-maker is not satisfied with the proposal, he/she is asked to analyze each criterion and specify whether he/she would like to improve it, to maintain at the current level, or he/she is indifferent to changes. Next the set of alternatives satisfying decision-maker's requirements is generated and a new proposal is identified using trade-offs between criteria that should be improved and the ones that can be decreased.

Let $\mathbf{A}^{(l)}$ be the set of alternatives analyzed in iteration l. The procedure operates as follows.

Initial phase:

1. Identify initial candidate alternative a_c:
   a) for each alternative $a_i \in \mathbf{A}$ calculate:

$$d_i = \sqrt{\sum_{p=1}^{r} \left(\bar{v}_p - v_{ip}\right)^2} \tag{4}$$

where:

$$\bar{v}_p = \max_{i:a_i \in \mathbf{A}} \left\{v_{ip}\right\} \tag{5}$$

   b) identify alternative ac minimizing the distance to the ideal point:

$$a_c = \arg\min_{a_i \in \mathbf{A}} \left\{d_i\right\} \tag{6}$$

2. Assume l = 1, $\mathbf{A}^{(1)} = \mathbf{A}$.

Iteration l:

1. Construct the potency matrix:

$$\mathbf{P}^{(l)} = \begin{bmatrix} \underline{v}_1^{(l)} \cdots & \underline{v}_p^{(l)} & \cdots & \underline{v}_r^{(l)} \\ \overline{v}_1^{(l)} \cdots & \overline{v}_p^{(l)} & \cdots & \overline{v}_r^{(l)} \end{bmatrix} \tag{7}$$

where:

$$\overline{v}_p^{(l)} = \max_{i:a_i \in \mathbf{A}^{(l)}} \{v_{ip}\} \quad \underline{v}_p^{(l)} = \min_{i:a_i \in \mathbf{A}^{(l)}} \{v_{ip}\} \tag{8}$$

2. Present evaluations of the candidate alternative ac and the potency matrix to the decision maker. Ask the decision maker whether he/she is satisfied with the proposal. If the answer is YES – assume candidate alternative ac to be the final solution and finish the procedure.
3. For each criterion ask the decision maker to specify the criteria which he/she would like to improve, to maintain at the current level, and where he/she is indifferent to changes. Let $\mathbf{I}_{>}^{(l)}$ be the set of indices of criteria, that should be improved, $\mathbf{I}_{=}^{(l)}$ – the set of criteria which value should be maintained at the current level, and $\mathbf{I}_{<}^{(l)}$ – the set of criteria for which the decision-maker is indifferent to changes.
4. Identify the set of alternatives that satisfy the decision-maker's requirements:

$$\mathbf{A}^{(l+1)} = \left\{ a_i : a_i \in \mathbf{A}^{(l)}, \forall_{p \in \mathbf{I}_{>}^{(l)}} v_{ip} > v_{cp}, \forall_{p \in \mathbf{I}_{=}^{(l)}} v_{ip} \geq v_{cp} \right\} \tag{7}$$

If $\mathbf{A}^{(l+1)} = \varnothing$, inform the decision-maker, that alternatives satisfying his/her requirements do not exist, go to step (2).

5. Identify a new candidate:
   a) for each $a_i \in \mathbf{A}^{(l+1)}$ calculate:

$$T_{ic}^{(l)} = \min_{(p,q):\, p \in \mathbf{I}_{>}^{(l)},\, q \in \mathbf{I}_{<}^{(l)}} \left\{ t_{ic}^{pq} \right\} \tag{8}$$

where:

$$t_{ic}^{pq} = \begin{cases} \dfrac{v_{ip} - v_{cp}}{v_{cq} - v_{iq}} & \text{if } v_{cq} > v_{iq} \\ \propto & \text{otherwise} \end{cases} \tag{9}$$

b) identify the alternative aj maximizing the value of $T_{ic}^{(l)}$:

$$a_j = \arg \max_{a_i \in \mathbf{A}^{(l+1)}} \{T_{ic}^{(l)}\} \tag{10}$$

6. Assume c = j, l = l + 1 and go to step (1).

The initial proposal is the one that is the closest to the ideal point, which is defined by the best evaluations attainable independently within the whole set of alternatives. When the new proposal is identified, trade-offs between criteria that should be improved and the ones that can be decreased are analyzed. The move from a_c to $a_i \in \mathbf{A}^{(l+1)}$ is done to improve values of f_p for $p \in \mathbf{I}_{>}^{(l)}$. If such change does not decrease the value of criterion f_q for $p \in \mathbf{I}_{<}^{(l)}$, then the corresponding trade off is set to be equal to infinity. The max-min rule in relation to analyzed trade-offs is used to identify the new candidate for the final solution of the problem.

3. Numerical example

The following example shows the applicability of our procedure for solving the new product selection problem. As we do not like to complicate the example to much we will not consider specific criteria for each category mentioned in the Introduction. Instead, we assume that each category will be represented by a single criterion that can be regarded as a compound representative of all aspects linked to this category. The notation for criteria will be as follows: f_1 – strategic, f_2 – organizational, f_3 – technological, f_4 – financial, f_5 – market response.

In consequence, the DM will be asked the question ”To what extend the alternative a_i contribute to achieve a goal represented by the compound criterion f_p ?”.

The role of alternatives will be played by 20 different new product projects that have different profiles in regard to evaluated criteria.

Table 1 presents evaluations of the alternatives with respect to criteria.

Table 1

Evaluations of alternatives with respect to criteria

Alternative	Criterion				
	f_1	f_2	f_3	f_4	f_5
a_1	44	87	78	24	100
a_2	44	93	39	6	24
a_3	94	13	50	41	31
a_4	6	53	89	12	4
a_5	56	100	17	59	85
a_6	100	20	6	0	70
a_7	88	80	61	24	43
a_8	31	93	39	18	53
a_9	94	40	50	71	37
a_{10}	31	20	89	88	72
a_{11}	0	33	100	35	32
a_{12}	88	80	22	6	91
a_{13}	56	93	17	53	36
a_{14}	88	55	44	29	80
a_{15}	81	7	72	100	46
a_{16}	38	100	0	71	21
a_{17}	25	0	83	94	68
a_{18}	56	67	89	47	0
a_{19}	13	93	83	18	16
a_{20}	50	87	83	65	15

The procedure operates as follows:

Initial phase:

1. Identification of the initial candidate:
   - the ideal solution is defined by the best evaluations attainable for each criterion – the ideal vector is as follows: [100; 100; 100; 100; 100],
   - for each alternative the distance from the ideal solution is calculated (Table 2),
   - alternative a1 is chosen for the initial candidate alternative, as it's distance to the ideal point is minimal.

Table 2

Distances to the ideal point

Alternative	d_i	Alternative	d_i	Alternative	d_i	Alternative	d_i
a_1	98	a_6	162	a_{11}	153	a_{16}	145
a_2	147	a_7	105	a_{12}	125	a_{17}	130
a_3	135	a_8	132	a_{13}	123	a_{18}	126
a_4	168	a_9	105	a_{14}	104	a_{19}	147
a_5	104	a_{10}	110	a_{15}	113	a_{20}	107

2. l = 1, A(1) = A

Iteration 1:

1. Potency matrix $\mathbf{P}^{(1)}$ is generated (Table 3).

Table 3

Potency matrix $\mathbf{P}^{(1)}$

Value	Criterion				
	f_1	f_2	f_3	f_4	f_5
min	0	0	0	0	0
max	100	100	100	100	100

2. Evaluations of the candidate alternative a1 and potency matrix are presented to the decision-maker. The DM is not satisfied with the proposal. The chosen alternative is characterized by the ideal matching to the market. It means that it will very likely enjoy the positive response from potential customers. It will may have comparable long life time and the competitors will not easy develop the competitive replacement. On the other hand, it's financial score is weak because it will need a substantial investment. Also it does not work very well with the strategic goals of the firm.
3. The DM specifies, that criteria f1and f_4 should be improved, and he is indifferent to the changes of other criteria: $\mathbf{I}_{>}^{(1)} = \{1,4\}$, $\mathbf{I}_{=}^{(1)} = \varnothing$, $\mathbf{I}_{<}^{(1)} = \{2,3,5\}$.
4. The set of alternatives that satisfy the DM's requirements is identified:

$$\mathbf{A}^{(2)} = \{a_i : a_i \in \mathbf{A}^{(1)}, v_{i1} > 44, v_{i4} > 24\} = \{a_3, a_5, a_9, a_{13}, a_{14}, a_{15}, a_{18}, a_{20}\}$$

5. Trade-offs are calculated (Table 4).

Table 4

Trade-offs identified in iteration 1

	t_{i1}^{12}	t_{i1}^{13}	t_{i1}^{15}	t_{i1}^{42}	t_{i1}^{43}	t_{i1}^{45}	$T_{i1}^{(1)}$
a_3	0,676	1,786	0,725	0,230	0,607	0,246	0,230
a_5	∞	0,197	0,800	∞	0,574	2,333	0,197
a_9	1,064	1,786	0,794	1,000	1,679	0,746	0,746
a_{13}	∞	0,197	0,188	∞	0,475	0,453	0,188
a_{14}	1,375	1,294	2,200	0,156	0,147	0,250	0,147
a_{15}	0,463	6,167	0,685	0,950	12,667	1,407	0,463
a_{18}	0,600	∞	0,120	1,150	∞	0,230	0,120
a_{20}	∞	∞	0,071	∞	∞	0,482	0,071

6. Alternative a_9 is identified as a new candidate, $l = 2$.

Iteration 2:

1. Potency matrix $\mathbf{P}^{(2)}$ is generated.
2. Evaluations of the candidate alternative a_9 and potency matrix are presented to the decision-maker (Table 5). The DM is not satisfied with the proposal. Alternative a_9 has mach better score of financial and strategic criteria in relation to a_1. However it is gained for the price of decreasing the scores of three other criteria, especially the market response.

Table 5

The evaluations of the candidate alternative a_9 and potency matrix $\mathbf{P}^{(2)}$

Value	Criterion				
	f_1	f_2	f_3	f_4	f_5
a_9	94	40	50	71	37
min	50	7	17	29	0
max	94	100	89	100	85

3. The DM specifies, that criterion f_5 should be improved, and he is indifferent to the changes of other criteria: $\mathbf{I}_{>}^{(1)} = \{5\}$, $\mathbf{I}_{=}^{(1)} = \varnothing$, $\mathbf{I}_{<}^{(1)} = \{1,2,3,4\}$.
4. The set of alternatives that satisfy the DM's requirements is identified:

$$\mathbf{A}^{(3)} = \left\{ a_i : a_i \in \mathbf{A}^{(2)}, v_{i5} > 37 \right\} = \{a_5, a_{14}, a_{15}\}$$

5. Trade-offs are calculated (Table 6).

Table 6

Trade-offs identified in iteration 2

	t_{i9}^{51}	t_{i9}^{52}	t_{i9}^{53}	t_{i9}^{54}	$T_{i9}^{(2)}$
a_5	1,263	∞	1,455	4,000	1,263
a_{14}	7,167	∞	7,167	1,024	1,024
a_{15}	0,692	0,273	∞	∞	0,273

6. Alternative a_5 is identified as a new candidate, $l = 3$.

Iteration 3:

1. Potency matrix $\mathbf{P}^{(3)}$ is generated.
2. Evaluations of the candidate alternative a_5 and potency matrix are presented to the decision-maker (Table 7). The DM is not satisfied with the proposal. This new candidate has generally good scores of four criteria (above 50%) besides a match to technical competencies which is quite weak (score is only 17).

Table 7

The evaluations of the candidate alternative a_5 and potency matrix $\mathbf{P}^{(3)}$

Value	Criterion				
	f_1	f_2	f_3	f_4	f_5
a_5	56	100	17	59	85
min	56	7	17	29	46
max	88	100	72	100	85

3. The DM specifies, that criterion f_3 should be improved, and he is indifferent to the changes of other criteria: $\mathbf{I}_{>}^{(1)} = \{3\}$, $\mathbf{I}_{=}^{(1)} = \varnothing$, $\mathbf{I}_{<}^{(1)} = \{1,2,4,5\}$.
4. The set of alternatives that satisfy the DM's requirements is identified:

$$\mathbf{A}^{(4)} = \{ a_i : a_i \in \mathbf{A}^{(3)}, v_{i3} > 17 \} = \{a_{14}, a_{15}\}$$

5. Trade-offs are calculated (Table 8).

Table 8

Trade-offs identified in iteration 3

	t_{i5}^{31}	t_{i5}^{32}	t_{i5}^{34}	t_{i5}^{35}	$T_{i5}^{(3)}$
a_{14}	∞	0,600	0,900	5,400	0,600
a_{15}	∞	0,591	∞	1,410	0,591

6. Alternative a_{14} is identified as a new candidate, $l = 4$.

<u>*Iteration 4:*</u>

1. Potency matrix $\mathbf{P}^{(4)}$ is generated.
2. Evaluations of the candidate alternative a_{14} and potency matrix are presented to the decision-maker (Table 9). The DM is satisfied with the proposal. Alternative a_{14} has good scores for three criteria (strategic goals, organizational competencies and market response) and somewhat weaker for technical competencies and financial features. It may be considered by decision maker as a satisfactory compromise solution.

Table 9

The evaluations of the candidate alternative a_{14} and potency matrix $\mathbf{P}^{(4)}$

Value	Criterion				
	f_1	f_2	f_3	f_4	f_5
a_{14}	88	55	44	29	80
min	81	7	44	29	46
max	88	55	72	100	80

Conclusions

An important part of the innovation management is to select the best new product project from the preliminary large set of potential alternatives. This problem is broadly discussed in the extant literature. Although the qualitative approaches dominate in literature, there are few examples of more formal decision procedures based on multiple criteria analysis. This article brings an example of interactive procedure that can help decision making in the new product development. As to the authors knowledge, such approach has not been proposed so far to the problem of selecting new product.

The interactive procedure gives to the DM an opportunity to actively participate in the whole process and observe its development. During the procedure, the DM can disclose his preferences and values of trade-offs. This kind of assessment of differences in importance of criteria is assumed as more reliable then the direct assessment of weights.

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