

Stages and methods of decision making

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Decision making is a choice from many possible variants of the one optimal with the help of certain methods, which consist in observing the sequence of decision making stages.

Keywords: decision making, problem statement.

Этапы и методы принятия решений

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Принятие решения — это выбор из многих возможных вариантов одного наиболее оптимального с помощью определенных методов, которые заключаются в соблюдении последовательности этапов принятия решения.

Ключевые слова: принятие решений, постановка задачи.

The sequence of decision making stages consider below.

1. Definition and formulation of the problem: in order to approach the decision-making process, it is necessary to formulate the problem, indicating what prevents its implementation.
2. The formulation of the desired solution: for this you need to take the ideal solution that most accurately determines the desired result.
3. Definition of conditions and limitations: after we have formulated the desired result, we determine the possible pros and cons in the case of the implementation of the decision made.
4. Problem statement: here the final desired solution is formulated to get the desired result.
5. Control and implementation: at this final stage, we move from theoretical postulates of decision making to concrete actions, which, as a result, will lead to the desired result.

There are several ways to make a decision to get this result: 1) a rational decision is the analysis and consideration of all component factors, 2) decision based on previous

knowledge and past experience, and 3) intuitive decisions - where you can skip some stages of decision making or not fully comply with them.

Further we will consider also a popular method of decision-making. SWOT-analysis, as a matrix for the systematization of information consisting of: Strengths; Weaknesses; Opportunities; Threats. The components of the matrix allow you to see the main problems of decision making. Using the information obtained, it is possible to analyze the relevant decisions and make the best choice of them. Below is an example of filling the matrix.

Along the axes of the matrix there are the zones of the analyzed organization (internal and external) and the type of influence on it (positive and negative). Then, the factors influencing the organization are distributed among the four categories of matrix. After completing the SWOT-matrix, comparisons of external and internal factors are made and for each of them certain actions are proposed, which are converted into actions of a particular organization. An example is given below.

	INTERNAL FACTORS	EXTERNAL FACTORS
AFFECT POSITIVE	<p>Strengths (Adjusted production)</p>	<p>Opportunities (Increase in demand)</p>
AFFECT NEGATIVE	<p>Weaknesses (Quality problems)</p>	<p>Threats (Increase in competition)</p>

Figure 1: Example of filling the matrix



	Opportunities (Increase in demand)	Threats (Increase in competition)
Strengths (Adjusted production)	Might be taken the solid decision and go ahead with it	Diversification, need to choose the very best
Weaknesses (Quality problems)	Need to compromise and search for partnerships to reduce problems	Refuse problematic components

Figure 2: SWOT-matrix

Universal decision-making method includes the following actions:

- Drawing up a list of criteria for comparing alternatives.
- Determining the importance of each criterion.
- Choice of grades to evaluate all alternatives according to the criteria on a 10-point scale.

- Evaluation of alternatives according to the criteria of the selected scale.
- Index calculation for each option, which is the aggregate of alternative evaluation products by criteria for the weight of this criterion.
- Choosing an alternative with the maximum index value as a solution.

The application of this method is shown in the diagram below.

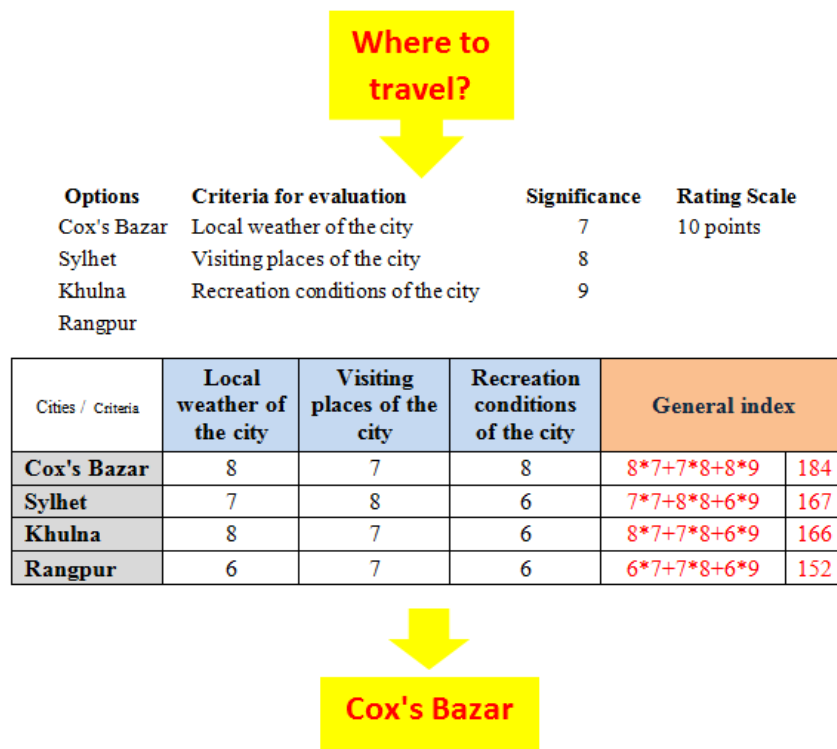


Figure 3: The application of SWOT-analysis method

The basis of possible decision making errors includes internal and external factors affecting its adoption. Internal factors is connected with the personal characteristics of the person making the decision. Externalities are related to the conditions of decision making and the influence of other people. In a separate group, it is worth highlighting the errors associated with the lack of control over the implementation of

decision making - this is an incorrectly stated goal and timeline for the execution of the decision.

As an example of choosing the best alternative solution is the development of a ticket booking program that can easily be used by the user from his own personal computer, where eight different functions were developed: void select_menu(void); void about_us(void); void show_cities(void); void signup_user(void); void select_place(void); void plane(int

c); void train(int b); void bus(int a). For the development of this program, C ++ language was chosen, which is enriched with String recognition, allowing the user to select the desired route, vehicle, ticket class, ticket price etc. The program

Pseudo code:

1: Declare Strings
 2: Declare and initialize array of strings for each divisions
 3: Set function about_us
 6: Set function signup_user
 5: Set function cities
 6: Enter the start point of travelling
 7: Enter the end point of travelling
 8: If start or end point absent
 9: Print the location might be wrong or absent
 10: If point entry input wrong
 11: Print sorry that entry does not match
 12: Set function select_menu
 13: Ask for choose an option
 14: Print press 1 to book ticket, 2 to view cities, 3 to about us or 4 to exit
 15: If press 1
 : Set function types_transportation
 : Message to press 1 by air, 2 by train, 3 by bus or 4 to exit
 : If press 1
 : Else if press 2
 : Show and ask for class

saves user data stored in a file compatible with database management software for further storage and management. This example is given below as an algorithm.

: Else if press 3
 : Show and ask for class
 : Ask for user data
 : Ask for quantity of tickets
 : Ask for confirmation
 : Show the amount of payments
 : Show options to pay
 : If payment complete
 : Print Ticket
 : Else warn to pay for selections
 : Then ask if want to exit
 : If yes
 : Go to 18
 : Else return to 13
 16: Else if press 2
 : Return to 5
 17: Else if press 3
 : Return to 3
 18: Else if press 4
 : Then exit
 19: END

To prevent mistakes in the decision-making process, a correct and thorough goal setting is necessary; collection and analysis of all possible information; compliance with decision-

making steps; the choice of methods and methods of decision making; controlling implementation of the decision at all stages.

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