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PROJECT MANAGEMENT IN BEHAVIOURAL PERSPECTIVE – COGNITIVE BIASES IN THE FORMULATION OF THE AIM OF THE PROJECT

DARIUSZ KIEŁCZEWSKI, ANNA MATEL, TOMASZ POSKROBKO

Corresponding author:

Dariusz Kięlczewski

Department of Sustainable Development, Faculty of Economics and Management, University of Białystok

e-mail: d.kielczewski@uwb.edu.pl

Anna Matel

Department of Sustainable Development, Faculty of Economics and Management, University of Białystok

e-mail: anna.matel@op.pl

Tomasz Poskrobko

Department of Sustainable Development, Faculty of Economics and Management, University of Białystok

e-mail: t.poskrobko@uwb.edu.pl

ABSTRACT

The article contains a behavioural analysis of the aim-formulating stage of the project. The purpose of the article is to point out that in the process of formulating the aim of the project, it comes to such decision-making situations which favour heuristic thinking. The article presents the results of the secondary research. As a result of verified theory, according to which in the process of formulating the aim of the project, the interference in decision-making processes may occur on the part of the heuristics and the resulting cognitive biases.

KEY WORDS

project management, behavioural economics, cognitive bias, aim of the project

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INTRODUCTION

In the face of turbulent changes in the economic environment of an organisation, management practice focuses on the process of continuous improvement so as to continually improve efficiency (including the reduction in time consumption and capital intensity) and ensure the high quality of both our products and services and management processes. One of the responses to emerging challenges is the concept of a project-managed organisation and implementation of the project management principles. In the theory of this field, dynamic changes occur, which is associated with both a growing interest as well as the universality of the areas of project

implementation. As a result, efforts are aimed at codifying good practices and indications in the project implementation. As a rule, these take the form of methodologies, representing the project management process and defining the scope of the tasks under each of its phases. Despite the undeniable advantages, they do not include behavioural analysis, which can provide a range of information on the regularity of decision-making, which in turn can translate into the improvement of economic efficiency of implemented projects.

The subject of the article is the aim-formulating stage of the project, which is crucial to its future success. The aim of the article is to point out that in the process of formulating the aim of the project, it

comes to such decision-making situations, which favour heuristic thinking. The authors of this article have attempted to assign corresponding categories of cognitive biases to the decision-making situations. The thesis of the article says that in the process of formulating the aim of the project, interference in decision-making processes may occur on the part of the heuristics and the resulting cognitive biases.

1. PURPOSE OF THE PROJECT

The main feature of projects is their purpose, orientation towards the implementation of specific and suitably-worded final result (Dąbrowski & Domagała, 2014, p. 4-5). The essence of a project is in fact to take the planned actions aimed at achieving the goal. This issue is raised in almost all definitions. For example, Kurznier defines a project as „aimed at achieving the target, requiring the use of resources and framed in time, cost and quality constraints” (Kerznier, 2005, p. 17). Similarly, the contribution of the project aim is emphasized by the definition contained in the standard for project management ISO 10006: 2005. According to the standard, a project is a „unique process consisting of a set of coordinated and supervised activities including the dates of the start and end, undertaken to achieve the purpose of meeting certain requirements within the time, cost and resource constraints” (PN-ISO 10006:2005, p. 13). On the other hand, according to the definition by the Project Management Institute (issuing the book on the good practice of project management PMBOK®) a project is understood as a temporary activity, the aim of which is to create an unusual product or service implemented having limited resources. Under the commonly used project management methodology of Prince2, developed by the Office of Government Commerce, a project is a temporary organisation established in order to manufacture products which support a specific business need (Dąbrowski & Domagała, 2014, p. 3).

Therefore, the definition of a project determines the way forward. Each activity within a project is focused on achieving the intended results. If, however, defining the intended purpose is not optimal, the achieved effects will not maximize the benefits flowing from the outlays either.

2. INTRODUCTION TO THE THEORY OF HEURISTICS AND COGNITIVE BIASES

The concept of heuristics and cognitive biases allows to look at the essence of an economic man through the prism of limited cognitive resources. The psychological analysis states that the human brain has a limited capacity of perception, collecting and processing information (Polowczyk, 2012, p. 60). According to Simon, management takes place in a kind of tunnel of restrictions. Hence, the freedom of action of an entity and its rationality can be shaped only within certain limits (Simon, 1995, p. 99). These restrictions affect almost all areas of human life, including the process of management, market, and managerial decision-making. They are reflected in the form of heuristic thinking, which in turn results in cognitive biases.

In the presented approach, heuristics is understood as a simplified rule of inference based on experience or the lore (Lewicka, 1993). On the one hand, it reduces the use of cognitive effort and the time that must be spent in the conclusion process. Hammond et al. indicate that in most situations, heuristics positively influences the decision-making process, because it provides instant suggestions in decisions taken under the pressure of time or the conditions of cognitive limitations (Hammond et al., 1998). On the other hand, the use of heuristics – especially in making key decisions, including strategic management decisions – can lead to non-compliance in inference with the rules of logic and lower the quality of decisions.

The consequence of heuristic processing is cognitive biases. Their essence is to ignore parts of the data and formulate assessments or decisions based on random information, characterized by a high adaptability (Falkowski & Zaleśkiewicz, 2012, p. 18).

The development of the concept of heuristics and cognitive biases is associated with key publications by Kahneman and Tversky (Kahneman & Tversky, 1979; Kahneman & Tversky, 1982), which pay special attention to issues of anomalies in decision-making processes of consumers, different from the classical theory of utility maximization. For this reason, the impact of heuristic thinking on purchasing decisions is a frequent subject of research. Today, attempts are being made to implement this area of knowledge to organisation management theory. The most common

problems discussed in this field are associated with the ability to stimulate the consumer market through the use of knowledge about the cognitive limitations of consumers. Less often, the subject of discussion is the impact of heuristic thinking on managers. In recent years, however, attempts of such analyses have been undertaken, mainly in the framework of strategic management (Narasimhen et al., 2005). This issue, however, is still poorly described in the Polish literature. Diagnosis of behavioural influence on the management process can bring positive effects in the form of increased efficiency as well as reduce the number of incorrect and sub-optimal decisions.

Camerer and Malmendier indicate the importance of the theory of heuristics and cognitive biases in the management of an organisation. In their opinion, it can be seen as both a threat and a challenge (Camerer & Malmendier, 2007, p. 235). This means that on this basis, one can identify both cognitive barriers resulting from an entity's behavioural anomalies, as well as the possibility of designing such management tools that allow you to maximize performance goals through the use of rules of heuristic thinking. This study focuses on the first of the identified problems.

3. COGNITIVE BIASES IN THE AIM-FORMULATION PHASE OF THE PROJECT

To formulate the purpose, towards which the project implementation will work, is to determine the expected results. On the basis of the behavioural analysis, it is considered that the choice of an aim is influenced by the decision-making context, including in this case a generated set of alternatives to choose from. Entities, making a decision, base it on a set of solutions, which take the form of a so-called set of known. In this group, a decision-maker selects the available ways of implementation creating a collection of considered solutions. It is important, therefore, that in the set of considered solutions are the best solutions. For this reason, the phase of generating alternatives significantly impacts the success of the entire project. In this phase, a decision-making situation occurs and is related to the recognition of a given aim as real and promising. Then, in the process of considering various options, they are the subject of valuation. The expected benefits are assigned to them, which is the basis for selection. Both, however, the process of generating alternatives

and their assessment, due to their high complexity and the need to involve cognitive resources, are conducive to heuristic thinking.

3. 1. Cognitive biases in generating alternatives

When deciding on the implementation of a project, an organisation faces a choice between a completely new courses of action or the one used in previously completed projects. At this point, it may come to affecting the decision-making process of the effect of sunk costs and the effect of IKEA, which can unreasonably lead to continuing unprofitable projects. Effect of priming and anchoring also has an essential meaning.

According to the effect of sunk costs, wrong decisions generate costs and involve entities particularly strongly. Interruption of a project without achieved effects causes the sense of failure. Therefore, an entity seeks to justify the decision taken previously, revealing a tendency to continue inefficient investments, even when the costs substantially exceed the estimated budget (Hammond et al., 1998). This effect has a strong influence on the implementation phase of the project, when the test results indicate the need for modification of the aims. However, it can also manifest itself in the initiation phase and lead to the classification of previous, unsuccessful projects to the set of projects under consideration, which in turn means the risk of the continued growth in ineffective projects. Achieving even a small positive effect would allow rationalizing the incurred expenditure, which would be a source of psychological comfort.

The IKEA effect may enhance the effect of sunk costs, but it can also stand alone. This effect indicates a peculiarity described by Ariely, which occurs in the area of attachment to property. According to it, the more work a person puts into doing something, the bigger is the feeling of attachment to the object. The correctness is explained by the author in the example of furniture requiring assembly, which, according to the study, consumers value more (after assembling) than the one they purchase ready-made. Ariely shows that the strength of attachment is proportional to the put-in effort (Ariely, 2008, p. 90). A similar effect can be observed in terms of support for ideas on project implementation, which relate to specific contribution of work. If decision-makers have suffered certain expenditures to generate an idea, they are mentally attached to the given alternative. As a result, it is seen as more important compared to other ideas, regardless of the merit.

The priming effect also has an impact on the generation of alternatives. According to this effect, the appearance of a stimulus modifies the correct processing of next stimuli. It causes giving the priority while determining the context and searching the memory for elements that have been primed. Most often, these are the signals received by a decision-maker directly before the effects of the stimulus causing the reaction. The priming factor activates a way to associate, with the result that the response to another stimulus is associated with the priming stimulus (Matuszewski, 2001, pp. 168-170). Thus, in the phase of generating alternatives, the appearance of random stimuli can affect the priming of a specific way of thinking about the project implementation. This means that the range of generated alternatives is dependent on external signals, often unrelated to an organisation or a project. It causes a change in the range of generated alternatives in time, and it is particularly significant when a project is initiated and carried out under the pressure of time.

The anchoring effect strengthens the impact of the priming effect. In accordance with it, entities estimate the value on the basis of a suggested baseline, which makes a so-called anchor¹ or the reference point. So, decision-makers show a subconscious attachment to initial suggestions (Tversky & Kahneman, 1974). Thus, the first created alternative is an anchor for further ideas. This is the reason why the phase for generating alternatives may come to create only ideas similar to the base. It means that probably individual alternatives may be deviated due to specific properties; however, from the point of view of the reference point they will be similar.

Hammond et al. indicate that the error of anchoring in management decisions may also concern a strong base decisions on historical data and forecasts of future events built on this basis, including sales results. Historical data in this sense are the anchor, so the decision-makers assume that future results may differ from it, however slightly. They do not appreciate the same other factors that may condition the effects of decisions (Hammond et al., 1998).

¹ Ariely presents an anchoring mechanism in the example of consumer choices, indicating that the role of an anchor is played by a suggested producer's price (e.g. regular, reduced) dependent on the producer of the good. Market prices affect the willingness of consumers to pay them. (Ariely, 2008, p. 67). In turn, Hammond et al. explain the effect on the example of the typical answers to questions "1. Do you think that the population of Turkey is higher than 35 million? 2. How would you estimate the population of Turkey?" The number in the first question is an anchor, while modifying the estimate declared in the second response (Hammond et al., 1998).

3.2. Cognitive biases of alternatives assessment

The decision-making situation, which is conducive to heuristic thinking is alternatives evaluation. Decision-making processes in the evaluation of alternative targets have high complexity. The decision-maker must compare many features, which often differ in the way of presentation, including the quantitative and qualitative form. For this reason, the decision-maker operating in conditions of limited cognitive resources takes such mental stances that allow him/her to restore the clarity of a decision-making situation. Tyska shows that in the assessment of choice alternatives, it often comes to errors associated with biased assessments prior to decisions. Decision-makers in particular are prone to widening gaps between an attractive alternative and alternatives perceived as less attractive (Tyska, 2010, p. 6). Despite the apparent simplicity of the described mechanism, it comes, however, to some decision-making situations. Then, three key questions must be asked:

- What schemes in the assessment of attributes of alternatives do decision-makers adopt?
- How promising is one alternative?
- How possible is it for the alternative to become a solution?

In terms of assessment schemes used for attributes of alternatives adopted by the decision-makers, the impact of the concentration effect, the legend effect, the insulation effect, the effect of mere exposure can be seen.

The focusing effect indicates that decision-makers are willing to make assessments on the basis of obvious reasons for them or specific details, not appreciating others. In other words, they focus their attention on the selected evaluation indicators. Research suggests that focusing only on selected items can have a twofold cause. Firstly, it may be due to views or beliefs. Secondly, decision-makers tend to focus on those elements of the assessment, which are more understandable to them (Lehman et al., 1992, p. 691). For example, in the assessment of alternatives, specialists of the field of human resources management focus on the alternatives, which put the emphasis on this aspect of the project, minimizing the importance of used IT solutions.

The legend effect, also known as hyperreactivity to clear signals, says that people react more strongly to descriptive information signals and do not appreciate statistical information (Polowczyk, 2012, p. 65). Thus, in the evaluation phase of alternatives, decision-

makers are likely to pay more attention to qualitative rather than quantitative data. In other words, the alternatives described qualitatively gain a mental advantage over those described quantitatively.

At the stage of the assessment of preliminary attributes, the isolation effect may be revealed, also known as the von Restorff effect. According to this effect, decision-makers remember these qualities of alternatives better if they can be distinguished by them. The importance of the effect is usually considered in psychology. A study conducted by von Restorff related to memorization of specific words from the list when they are distinguished from other elements. Cohen and Carr conducted a study on the relationship between the ability to remember faces and the existence of details that distinguish them, pointing out in this regard a positive correlation (Cohen & Carr, 1975, pp. 383-384). Thus, alternatives different from the other, and the different characteristics are better stored. This can lead to the start of a mere exposure effect. According to this effect, under the influence of frequent contacts with a given object, affective attitude towards it is changed. This is the reason why individuals prefer better-known stimuli that are closer to them (Zajonc, 1968). Thus, better memorization may lead to distinguishing a given alternative.

3. 2. 1. Cognitive biases related to the assessment of alternatives

As indicated by Tyszka in the evaluation of alternative solutions, decision-makers evaluate an alternative as promising and then seek to sanction it (Tyszka, 2010, p. 6). The key question then is: what makes an alternative promising? The explanation may be the impact of primacy effect, the asymmetric dominance effect, authority effect, hedonism and the search for the domineering structure.

Due to the primacy effect, individuals are willing to build an opinion on the basis of characteristics of a given option, in the first place. As indicated by Tyszka, a certain selection option is quickly considered promising (Tyszka, 2010, p. 12). During the phase for the selection of alternatives, a particular option may be perceived differently if an individual presenting it starts their presentation with a strong argument for it, rather than the analysis indicating a possible risk or weakness. The first given argument influences the way of processing the remaining arguments. This mentally classifies a particular alternative as promising or rejected.

According to the asymmetric dominance effect, decision-makers seek for such an alternative, which in a given set has an option far worse than itself. This means that they perceive those alternatives as attractive which may be easily compared to others (Tyszka, 2010, p. 12). This is due to the fact that comparing the choice alternatives, individuals ignore the elements, which combine alternatives, and they focus on the points of difference (Czerwinka & Rzeszutek, 2011, p. 29). Thus, an alternative becomes more attractive if it is within the set with an alternative worse than itself in respect of at least one feature and not worse in other respects. The comparison of these two alternatives is a simple procedure for a decision-maker. He/she has confidence that one alternative is better than the other and marginalizes the fact that it may not be the best of all alternatives because the comparison of the entire collection is a difficult procedure that requires a significant commitment of cognitive resources. Therefore, decision-makers subconsciously perceive the alternatives that are dominant asymmetrically as promising.

In the selection of promising alternatives, the hedonistic approach may also be relevant. The term hedonism can be used in many contexts. In philosophy, it is the view that recognizes pleasure as the highest good and goal of life. In the narrower sense of the phenomenon of hedonism, it is understood as a desire to experience pleasure. Neuroscience indicates that this phenomenon is one of the main motivations of human behaviour and is related to the secretion of dopamine. Research conducted by Sharot (2009, pp. 2077-2080) indicates that at the time when a person is considering various options, dopamine signals are of the intensity of pleasure associated with the implementation of a given scenario. This chemical signal is then subconsciously taken into account in the decision. With regard to the selection from among alternative ways of project implementation, decision-makers are willing to evaluate scenarios not only on the basis of objective criteria, such as economic efficiency but also, on the subconscious level, taking into account hedonistic circumstances, as, for example, the amount of put-in work, the potential pleasure of the project or the need to take difficult decisions.

The perception of an alternative as promising is also influenced by the obedience to authority, distributed through research conducted by Milgram (1974). The effect is based on the manifestation of excessive trust and support in connection with the

assigned authority. Scientific studies provide a range of evidence for the effect of the obedience to authority in management systems, as well as on financial markets (e.g., Zaremba, 2010). With regard to the assessment of alternative project goals, this effect consists of supporting strategies assigned to a person, not its merits. This means that in assessing specific alternatives, a group tends to confirm those of them, which support or whose authors are people recognized as an authority.

3. 2. 2. How does a 'promising' alternative become a choice?

Another area, in which cognitive biases may become apparent, is the process of selecting an alternative subconsciously recognized as promising. The search for a dominant structure, the confirmation bias, and the herd instinct lead to confirmation of its superiority, which results in the selection of a promising alternative.

Tyszka indicates that in the process of assessing choice alternatives, decision-makers tend to seek for a so-called dominant structure. This process involves finding the structure of the problem, in which one alternative may be considered to be better, at least in selected respects and not worse in other respects. As a consequence, it makes it a given alternative the best, making it easier to make a choice. In the search for the dominant structure, decision-makers have a tendency to (Tyszka, 2010, pp. 7-8):

- reduce defects of the promising alternative (e.g., underestimation of the associated risks),
- deny drawbacks of this alternative by identifying them as advantages,
- combine two qualities of alternatives in order to justify its attractiveness (e.g., the realization of a goal requires a significant investment in the creation of research equipment, which is a disadvantage, however, the laboratory is better equipped, which in turn is an advantage),
- exaggerate defects and downgrade the advantages of a rejected alternative.

As a result, after determining a given alternative as promising, the decision-maker seeks to justify the subconscious choice. In this process, the decision-maker overestimates the importance of advantages, not appreciating defects. At the same time, he/she underestimates the importance of benefits of other alternatives, overestimating their weaknesses.

In the search for the dominant structure, confirmatory bias appears, which relies on the tendency to search for information confirming the

hypothesis, while avoiding confrontation with the facts, which could disrupt the accepted way of thinking (Polowczyk, 2012, p. 65). This means that decision-makers are not able to objectively evaluate the new evidence or arguments. The effect manifests itself particularly in a situation where the decision-maker is at the disposal of the two conflicting pieces of information (or data, on the basis of which conclusions are formulated) regarding a planned result of the project. In such a situation, he/she is willing to entrust this information, which confirms the earlier formulated hypothesis (Hammond et al., 1998), or in the case of a choice of the project result – a promising alternative. Kosnik, conducting the research in the field of opinion on the acceptance of fiscal policy in the United States, has proved that confirmation bias occurs even at the absorption of relatively conclusive evidence and can affect whole groups of people (Kosnik, 2008, p. 193-214). At the same time, it can modify not only the choices of individuals, but also communities, which is especially important in project work.

Another effect, which influences the choice of a promising alternative is the herd instinct, also called the herd behaviour. It is associated with the conformism to the behaviour of the group. Primary research in this area conducted by Banerjee showed that in a sequence game when the first two players choose an option, the third player, in spite of personal beliefs and information, also chooses this option (Banerjee, 1992). This means that the attractiveness of a given alternative increases with the increasing support of the group. Thus, if individuals recognize an alternative as promising, the herd behaviour towards conformity will encourage other entities to support it.

CONCLUSIONS

To sum up, an appropriate formulation of the aim is one of the most important decision-making processes that occur in the field of project management. This process is difficult, time-consuming and requires the engagement of cognitive resources. In this respect, it promotes the start of heuristic processing, which makes decision-makers prone to cognitive biases.

In the aim-formulation process, cognitive biases may occur in some basic decision-making situations. Table 1 presents an attempt to organise specific cognitive biases, which can modify the behaviour

Decision-making situation		Cognitive bias		General meaning	Possible consequences			
Generating alternatives		Sunk cost effect		tendency to continue unprofitable investments generating costs	willingness to continue the previous projects which do not generate effects			
		IKEA effect		increase attachment to the object with the increasing workload associated with it	increased commitment to alternatives with increasing amount of work needed to generate it, supporting inefficient alternatives			
		priming effect		a change in the processing of additional stimuli under the influence of the priming factor (often accidentally)	random stimuli appearing at the stage of generating alternatives affect the way we think about the project			
		Anchoring heuristics		strong attachment to the initial suggestions, which constitute a reference point	In the phase for alternative generation, the first emerging alternative has the essential function			
Alternatives' assessment	Biases connected with using simplified rules for comparing alternatives				Alternatives' assessment schemes	Focusing effect	evaluations based on obvious evidence or specific details, not appreciating others	attaching great importance to the qualities of alternatives, in which the decision-maker is a specialist and to obvious comparison criteria
						Legend effect	hyperresponsiveness to clear signals, a stronger response to descriptive signals and not valuing statistical information	giving more attention to the qualitative data than quantitative data during the evaluation of alternatives
						Isolation effect	remembering better the objects, which stand out in the environment	Decision-makers better remember the qualities of alternatives, which can be distinguish by them, marginalizing the importance of the common or similar elements
					Choice of promising alternative	Primacy effect	the tendency to build an opinion on the basis of the characteristics of the given options in the first place	the dependence of the overall assessment of alternatives on the order the arguments are presented
						the asymmetric dominance effect	preferring alternatives, which in the given set has an option far worse than them	a better evaluation of alternatives in the set of well-known with a worse alternative, underestimating the alternatives which are difficult to compare
						hedonism	the desire to experience pleasure	subconscious choice of alternatives associated with personal pleasure or minimal inconvenience
						Authority effect	The manifestation of excessive trust and encouraging individuals in connection with their authority	supporting the strategy assigned to the decision maker, not its merits
					Strengthening of promising alternatives	Searching for dominant structure	search for such a problem structure, in which one alternative may be considered to be better	overestimating the benefits and underestimating the disadvantages of promising alternatives, exaggerated defects and underestimation of the benefits of other alternatives
						Confirmation bias	the tendency to search for information confirming the hypothesis	the search for information confirming a promising alternative and undervaluing facts against it
						Herd instinct	the attractiveness of a given alternative increases with the support for it in the group	promotion of alternatives considered by the group as promising

of decision-makers.

In the phase of generating alternatives, the effect of sunk costs may lead to the continuation of unprofitable projects. The IKEA effect makes the alternative, the generation of which involves a certain amount of work, more attractive. The effect of priming and anchoring limit the number of generated alternatives.

Then, in the evaluation phase of alternatives, it comes to the adoption of simplified forms of inference. Decision-makers have a tendency to focus on selected aspects of the alternatives, they attach more importance to quality data and remember the distinctive elements of alternatives better. Then, on the basis of general methods of inference, a decision-maker starts to see a certain alternative as promising. In this respect, the process can be guided by the primacy effect, assessing a given target through the prism of the features associated with it. The asymmetric dominance makes those alternatives more attractive, which have far worse alternatives in their set of options. The authority effect strengthens the options that are supported by people recognized as an authority. Hedonism leads to the unconscious subjectification of alternatives' assessment. Then decision-makers seeking to preserve the clarity of the decision-making process have a tendency to overestimate the benefits and underestimate the drawbacks of alternatives subconsciously recognized as dominant. They tend to trust people confirming the accepted hypothesis. They attach greater importance to alternatives advocated by the group.

Knowledge of these regularities can help to improve the optimization of the aim of the project. Decision-makers aware of their own limitations are able to some extent, control the heuristic thinking, thus avoiding the cognitive biases. The manner and methods of control are of interest to behavioural engineering and should be subject to separate analysis.

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