IMPACT OF CRISIS SITUATIONS ON DECISION-MAKING

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Abstract

The main task of crisis management consists in resolving the issues related to threat events, which are burdened with risk. Those risks may have different sources and various levels of the probability of their occurrence. The lack of interest in the topic may result in social and economic consequences. For this reason, the new society has created the necessity for a crisis management system and the participation in it of “risk-managers”, specialised in management during crisis situations. The purpose of the article is to present a methodological basis of the process and the decision reached in the circumstances of risk.

Key words: Crisis management, risk, risk management, decision-making

Management is defined as “a system of actions which regulates the functioning of a certain organisation according to the set goals”. Hence, it is often identified with the management by objectives and the conscious formulation of these. These words indicate that management is closely related to the functioning of the organisation, understood as a group of people with a common goal, tasks, plan and programme of action.

Crisis management inspires continued interest. It is “still an area subjected to extensive testing by representatives of multiple disciplines, among which - due to its nature – the most prominent are the security studies. As a result of these activities, studies (...) have been created (...) primarily concerning: the organisation of crisis management, the characteristics of state capacity that could be deployed in the management itself as well as the relations between the elements of the crisis
management system”3. An important role in the scientific exploration of the issue of crisis management is played by decision-making in crisis situations, including the methods used during this process.

The concept of the method is found in many areas of expertise. The word “method” derives from the Greek *meta hodos*. It means the path leading to the goal, to follow someone, to prosecute or to track.

Generally speaking, the term “method” can be determined, following T. Kotarbiński, as a systematic used way - wherein the way is a certain course of action, hence, the composition and the arrangement of the stages4. In the context of the foregoing considerations, it is worth noting at this point, that T. Kotarbiński claimed: “every way is the way of some action. So what is the way of the action? This definition might be clearer though: the way of a particular action - it’s a deliberate course of this action. To get an accurate answer, let us be aware that every action is a process, which is an event of a change, in a particular case - of a constant change. What then is the course of a process? Probably nothing else but this, for what and how mutually-connected states composed this process: in brief, the course of the process is its composition and arrangement of states. Therefore, we understand the state of the event as any section of its time.”5 J. Zieleniewski defined method likewise: “we will understand the method of operation as a way of the study, used deliberately, in the belief that it can be applied successfully to the study and other studies of the same type – with the distinction of further important characteristic of the states and the realisation of mutual response to these states”6.

It is worth noting that because of the interdisciplinary nature of modern science, its methodology is also interdisciplinary for its fields. The methodological function expresses itself in the knowledge of the scientific methods, tools and techniques relevant to scientific knowledge in a specific discipline7. (…) in a general context methodology (…) has the following meanings:

- functional - is a system of cognitive activities, aimed at creating a system of knowledge about scientific methods and research methods (…),
- subjective - is a system of scientific knowledge about the methods of scientific research, safety system development of scientific knowledge (…) and the production and consolidation of the achievements of scientific knowledge8.

When deciding on the method, we need to pay attention to the aspect of the heuristic as a creative factor and to avoid excessive formalisation of conduct,

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7 Por.: W. Pytkowski, *Organizacja badań i ocean pracy naukowej*, Warszawa 1985, p. 63.
to prevent or limit the creativity of the acting person. By increasing the level of generalisation of methods (reducing the level of accuracy), we can distinguish:\n\- sub-methods or micro-methods, hence, the prescriptions of conduct, constructional, strictly programmed activities (algorithm),\n\- local methods, which fit only to solve the problems of a particular class (techniques);\n\- general methods, i.e. matrix method of discovery,\n\- super methods or certain attitudes of mind, towards the problems that can determine the strategies of thinking, i.e. a systemic approach and situational approach,\n\- guiding myths of creative thinking, i.e. the myth of pure product chemistry or universal magazine in economics and organisation.

In accordance with the principle of moving from the simplest of methods, deriving from the action of the individual people and individual problems, to increasingly complex methods, including the operation of teams which aim to simultaneously solve many of the decision-making problems, there comes another question: what is the crisis?

Crisis (gr. krisis) means no more, no less - a turning point, a breakthrough; decisive moment; a qualitative change in the system. In the crisis theory, the considered system is the body, institution or organisation, including society. It should be noted at this point that the objective term of a crisis is a “break” of the existing system, consisting of changing the structure or function, or both elements together. The phenomenon of “breaking” of the system is continuous in time and implemented in certain conditions of functioning. It is integrated into the process of transition from stability - through instability - to the stability of qualitatively different properties\n
In the ontological sense, the crisis is the accumulation of conflicts in various areas of social life. And here comes the next question: what is the hallmark of the crisis? “The crisis is composed of three elements: time pressures, the possibility of basic threats and surprise as well as the fact that it is the result of both the danger and the circumstances in which it occurs”\n
By taking into account the three basic aspects of human functioning: thinking, feeling, behaviour and their relationships, R.A. Myer, R.C. Williams, A.J. Ottens and A.E. Schmidt constructed a crisis model in three dimensions in 1991. “In this model each of the aspects of the human being is measured on a three-grade scale. In terms of thinking, the following states stand out: a collision with a difficult situation, a strong sense of danger, exceeding the emotional limits and possibilities of action.

11 Ibidem, p. 10.
The following emotions have been distinguished: a sense of anger and hostility towards people and situations, fear and overwhelming anxiety, and sadness and depression paralysing the ability to think and act in the last stage. The authors of the model proposed to divide the behavioural field into three stages: misguided action, avoiding action and paralysis of action. All the values are listed in ascending order. A person surviving the crisis can be found anywhere in the three-dimensional state space of thinking, acting and feeling. Assuming only three-scales for these aspects, we get 27 basic conditions associated with the crisis, which anyone can find himself/herself in. If one considers that each of the degrees of these three areas has a different degree of severity, the amount of subjectively perceived crisis states grows in an exponential manner to a large number. This model illustrates the uniqueness of each crisis, and at the same time makes it possible, at least in general terms, to know in what condition the person is whom we are trying to help. To tell, we must determine and classify in three levels the subjective feelings of the person in these three basic aspects of human functioning.¹³

The issues of crisis management are closely related to the issue of crisis. The analysis of views on the process of crisis management can distinguish two approaches to the issue in question. One brings the issue of crisis management solely for civil protection; the other refers to the specific issues of safety management.¹⁴

Object and subject of crisis management seem to be, because of its importance, the issues that are extremely important for security (…) given the steady increase in the hazards. This increase - usually painful - is often, acceptable “because of the extraordinary potential of humanity, which triggers both those who pass through the crisis, as well as those who seek this way to helpfully accompany them. It is a secret that the crisis is precisely the way of development. That you have to pay the price of suffering, if you want to achieve something that really has a value. The presented - very selectively and briefly - views on the crisis seem to indicate that there is no other way. Development must be achieved through the work of the abandonment of what was in the past to be open and ready to welcome the future. The unpredictability and uncertainty inherently present in the process of life does not allow the possibility of a confrontation with something in the subjective perception of the person, who interprets it as incomprehensible and beyond its capabilities, to be eliminated. The acceptance of this reality leads to the satisfaction of overcoming the transition to “the other side” of the crisis. Satisfaction with which - I think - nothing else can match.”¹⁵

In examining the issue of decision-making in crisis situations, it can be noted that there is no subordination of decision-making methods to categories of problems

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that remain unsolved. The methods used are associated with a decision-maker rather than with problems. The choice of methods for the class of the problem is often random. It seems that this is what causes the low efficiency of decisions. This shows that the managers are not very professionally prepared and ignore the more complex methods of decision-making. It could also be the lack of motivation for the decision, the possibility of its use or the submission of all aforementioned phenomena\(^{16}\).

In order to increase the rationality of the methodological decisions in crisis situations, we should find the key that links the identified problems with the above methods. Many of the techniques and methods of the receptive group, described in the literature, such as methods based on forced associations (i.e. using linguistics), by reversing the thought process (i.e. Socratic dialogue, anti-topic, antimony, the search for contrast, etc.) often complicates the process of thinking and adds little to the search for creative solutions. The decision-maker, by seeking favorable techniques and methods for creative problem-solving, should above all be guided by the principle that it is not important what has been widely recognised, but what can effectively deal with the increasingly difficult problems of crisis. He should, therefore, apply methods and principles developed by science, since they allow better and fuller use of one’s mental potential, while solving the problems\(^{17}\).

By studying the appropriate literature, he can determine heuristic guidelines included in the group of receptive methods. These methods are not able to bestow the gift of creativity, but they fundamentally contribute to its stimulation and development. Heuristic directions play a very significant methodical role in problem solving in crisis situations. They pay attention to things seemingly obvious, but because of that, they are often overlooked or underestimated. The selection of various combinations of heuristic strategy leads through associative methods to the combinatorial ones. This group includes the most efficient method of creative thinking. As previously mentioned, the distinguishing feature is the pursuit of an entity to present the results of creative thinking in a structured form\(^{18}\).

Teratology technique involves degeneration of the phenomenon to the size of the absurd; the problem boils down to the paradox, which through the pathological picture stimulates the heuristic search for needed changes.

The representation technique creates models of the research subject. Further, the model is used to design. For example, the terrain model, which is then analyzed, reveals the essential features of the constructed rescue operation.

The lawyer technique is particularly useful in solving the problems of planning the concept of recovery from the crisis. One of the selected people assumes the role of a lawyer and at all costs defends the analysed variant, putting aside any arguments that are made against it\(^{19}\).

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\(^{17}\) Ibidem.

\(^{18}\) Ibidem.

\(^{19}\) Ibidem.
In a situation where the decision-making body encounters poorly structured problems, with a divergent character and cannot reasonably cover the whole problem, the recursive method should be used. This method belongs to a group of integrated methods and consists in the distribution of the fundamental problem to the partial ones that can be solved with simple combinatorial methods\(^{20}\).

A similar method is an analysis of cause and effect, which belongs to the group of inductive methods. The decision-making entity makes changes to one or more aspects of the problem to cause the required changes in some of its other aspects. Achieving success depends on the mutual relationship between what the decision-maker changes and what he is going to change\(^{21}\).

When considering the conditions of the contemplated problems, we need to refer to the object and subject of research problems of decision-making in crisis situations. It should be emphatically stressed that in this case, the “object of study is social reality of the field or discipline, while the subject of research is the characteristics of the objects, properties and relationships between them. Hence, the basic question is what do we learn in the process of scientific research? Any objects of the human mind and studies can be naturally divided into two types, namely the relationship between ideas and facts\(^{22}\). We recognise the relationships between the ideas via our minds and we know that they exist independently of any object, hence the conclusion about an intangible object of cognition. We recognise the facts via senses or tools, with whose help the mind and the senses are able to interpret them. Hence, the conclusion about the material objects of study. Materiality in studies is perceived not only by its physical characteristics, but also through the relationship of cause and effect\(^{23}\). Thus, a material object can be seen with the mind on the basis of the observed, identified effect\(^{24}\).

By solving the decision-making problems in crisis situations, we look mainly for the necessary, supplementary and accidental factors determining the observed effect. The aim is to formulate a request for a high degree of probability under certain circumstances, treated as data. So in the practice of economic and social management systems, one is not looking for a cause in the sense of the above definition, but is seeking to extract the conditions of supporting and contributing to the occurrence of a certain, unitary in some cases, event - effect\(^{25}\).

The decision-maker in his activity is struggling constantly with the laws of cause and effect. When the effects of a certain event become so important that intervention is required, he should define its place in the chain of causes and effects. When the

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20 Ibidem.
21 Ibidem.
considered effects are undesirable, unexpected and cannot be directly explained, he can use such an instrument as the cause-and-effect analysis.  

During the identification of adverse consequences, the decision-maker can choose one of three types of actions: delete them, “postpone them” and remove them later, or adapt them to the new situation. In response to the resulting situation, he should decide which action to apply. If he considers it necessary to correct the unfavourable situation, he can react in two ways. He may say, “I know why this situation exists and the only problem is to select the desired mode of operation” or “I’m not sure about the causes of the events taking place and therefore I should analyse the problem before I proceed to solve it”. There is another possible way of reaction, unfortunately, too often encountered in practice: “I think I know the reason why, so I begin to act”.

The cause-and-effect relationship between specific variables can be extremely complex and may be determined by other variables.

Effective decision-making problem solving leads to the removal of the causes of its origin; therefore, the basic task is to search for these reasons. The decision maker who tries to solve the problem seeks to establish a hierarchy of causes and effects; hence, he wants to determine the chain of causes and effects, which leads to the point where he can take actions that eliminate the problem. After each step down the chain of causes and effects, the decision-maker should be sure that the specific cause is real, and not merely hypothetical. This allows him to focus on the core elements of the problem, not to get distracted by trying to solve many interrelated problems.

Prior to the cause-and-effect analysis, we must meet the following conditions:  
– the actual adverse effects should occur, that is, some predicted events should occur,  
– sufficiently significant deviation from the expected effects of the events should occur,  
– one must know the causes of an appropriate reaction to these effects.

Each process of solving the problem in the practice of the crisis situation management should be consistent with the principle that the first step to a solution is a thorough understanding of the problem. A clear and precise definition of the problem is already the start of its resolution. This is not an easy task, contrary to popular opinion. If we ask ten decision-makers (each separately) to define the essence of the problem, we get several different answers. Individual descriptions of the problem vary considerably from one another. Therefore, in order to obtain the necessary set of elements defining the essence of the problem it is preferable to use certain parameters. Such parameters may be four questions: What? Where?

26 Ibidem.  
27 Ibidem, p. 69.  
28 Ibidem.  
29 Ibidem.
When? To what extent? By putting specific questions, the decision-maker is trying to determine the essential facts concerning the problem, independent of his experience.

The next step in the analysis of cause-and-effect is to study and review the reasons on the basis of the individual experience of the decision-maker. This experience has, in fact, a colossal impact on the perception of the variables characterising the issue.

In the early stages of cause-and-effect analysis, one focuses one’s efforts on identifying and defining the problem. He seeks to achieve three objectives: increase the degree of understanding of the problem, provide the basis to determine the causes and create the conditions for review of possible causes and analysis30.

 Conducted studies tend to seek link between the problems with the method at the time of transformation of the identified problem (the original model) and the abstract task (the secondary model). Skilful projection of the problem into an abstract task allows the structure of the problem to be identified and the method for solving it to be selected. The key is, therefore, the ability to choose the models for the existing problems31.

The model is the one that enables one to think or to materially realise the system, which reflects or recreates the subject. Furthermore, it is able to replace itself so that its study provides new information about the test object32. To put it simply, the model is understood as a simplified (intentionally and deliberately) representation of reality. The nearest definition to the article content is stating that the model is a sketch33, which for a given range of problems, is the representation of a certain class of phenomena more or less isolated from the context of the observer34, to form the basis for research and (or) communication.

The philosophical basis for modeling is isomorphism, which means similarity in forms by the qualitative difference of phenomena. Thanks to that, a study of one phenomenon can be replaced with another study of similar form and structure under strict limits and conditions. By modeling, one can test, for example, mathematical relationships describing the phenomenon, instead of studying an original (crisis).

The most popular models of crisis, well-known in the literature, include35:
– mathematical models of operations (operational research),
– mathematical simulation models (the spread of flood, fire or epidemic).

31 Ibidem.
32 K. Ficoń, Inżynieria zarządzania kryzysowego podejście systemowe, Warszawa 2007, p. 43.
33 This is a mental (internal) or figural (diagrams, mathematical formulas, etc.) description, generally reduced to the most important features of a symbolic nature.
34 Certain aspects of the (often indirect) relationship between the observer and the observed system (class of phenomena and the range problem) cannot be separated from the model that represents them in the same way as the system. If someone takes a model for the representation of the class of phenomena for a given range of problem, he should do it consciously.
Krzysztof Ficoń presents classical models of the system of emergency response and systems and national security management, describing the dynamics of activities, statistical models of action and dynamic programming\textsuperscript{36}.

The game theory is often applied. It allows the rational behavior of people in conflict situations to be predicted. Another model is the so-called “railway model”. It can be used to help the manager to decide on the most advantageous variant of how to “handle” the crisis - and in what order the individual executive teams should carry out activities.

The choice of model is a compromise between its destination and the resources at our disposal. Figuratively speaking, this is a “path between the swamp of complications and the abyss of simplifications.” This is a paraphrase of a laconic position “what is simple, is false; what is complicated - is useless”\textsuperscript{37}.

A specific form of the use of models is simulation. We understand the term as an experiment carried out on a model of the tested system; the model used means a more or less a formal and accurate representation of the real system\textsuperscript{38}. In this definition, the concept of a model appears again, which is defined here as a formal representation of the real system. Examination of crises by modeling may allow the description (of the crisis), and reproduction of past behavior to be used to predict future behavior and teach applicable theory\textsuperscript{39}.

Simulation can be discrete or continuous; the criterion for inclusion in one of these groups is the nature of the tested system. Continuous systems are typically described by differential equations; simulation of such model is called a continuous simulation. In discrete systems, in which the decisive element is the event, the description is mainly composed of logical equations defining the conditions for the occurrence of specific events. The simulation is based on tracking changes in the status of the system and resulting from the occurrence of subsequent events. This is a discrete simulation.

The simulation model is not a unique model but simply one used in the simulation, i.e. the model used to create the history of the state, which is regarded as the history of the state of the modeled system. So the simulation does not specify the nature of the model, but how to use it.

The computer simulation model is a logical representation of mathematical concepts, systems or actions, programmed to be solved using a very high-speed digital machine. This model can be deterministic, when it is an analytical representation of concepts, system, or activities in which the data results are clearly defined. The model is non-deterministic or stochastic, when the functional connections depend on the random numbers. You can also distinguish models of the expected (or average) value, in which the sizes will be randomly assigned to their expected (or average) value.

\textsuperscript{37} M. Podgórskaa, \textit{Łańcuchy Markowa w teorii i w zastosowaniach}, Warszawa 2001, p. 52.
\textsuperscript{38} S. Heilpern, \textit{Dynamika i niepewność w modelowaniu ekonomicznym}, Wrocław 1998, p. 43.
\textsuperscript{39} See more in: B. Wiśniewski, J. Koziół, J. Falecki, \textit{Podejmowanie decyzji…}, op. cit., p. 70.
values. It is clear that a computer simulation model may have all or only some of the features of deterministic stochastic models or value expected models.\(^{40}\)

Simulation modeling resembles a physical experiment, but carried out in the area of abstract descriptions of the various pieces of operation of the facility. This allows one to observe phenomena in the property (the system of socio-economic), which are not normally available to the observer. The simulation model is relatively simple; one can take into account the impact of a large number of links and impacts described in a determined or stochastic manner.

The simulation models recreate (imitate) in computer technology the current functioning of the socio-economic system (organisation) in the adopted (determined by the investigator) time scale. These models recreate the current mechanisms and characteristics of the socio-economic system under specific conditions. Modern computer technology allows for a limited time to make a broad review of the processes of the model under different conditions. This enables conclusions to be drawn about the properties of the tested model, similar to the ones in the analytical methods.\(^{41}\)

The most important classification of objects (in cognitive terms) for simulation methods is to divide them into objects and processes.\(^{42}\) Objects are in this classification defined as items with outstanding stable characteristics; processes, on the other hand, are objects of varying qualities. The concepts of the process and the object are flexible. The same item can have the features of an object and process, i.e. music for the listener or performer is a process, while an object for the musicologist; crisis situation for the participant is a process, while the analyst sees it as a subject. In some analyses, processes are treated as a set of states and transitions between states. Then the state of the process is understood as an object. In these terms we should consider a process of crisis as a set of successive states (crises). These states are subjectively perceived by the parties affected by the crisis and are the cause of their actions. During operations in a crisis, no one specifies when someone else should take another decision.\(^{44}\)


\(^{41}\) Ibidem.

\(^{42}\) Through this process we understand any string of changes occurring in directly consecutive or overlapping moments \(t_1, t_2, ..., t_n\), intentionally singled out in some respect as a whole. In: L. Krzyżanowski, *Podstawy nauk o organizacji i zarządzaniu*, Warszawa 1992.


Conclusions

In summary, it should be emphasised that decision-making in crisis situations is a complex undertaking. This position is dictated by the fact that “the crisis is a threat because it can so much as sway a unit, causing serious decompensation, manifested aggression aimed at oneself or other people. It can also lead to a symbolic withdrawal from the situation that is impossible to withstand. The threat is also an apparent coping with the crisis, causing as a result its chronicity, which impairs the delivery of the roles and interpersonal relationships, and also blocks the development. On the other hand, the crisis could be a chance to break down internal barriers that block the search for outside help. This may be the beginning of the road to real solutions for the old problems and new opportunities”.

With this in mind, it should be emphasised that the choice of decision-making methods in crisis situations is as important as the fact that the basis of operation for the decision-maker should be the strategy to counter crisis. In addition, this action should be prepared and planned, and decisions taken appropriate to the nature and scale of the problem and the competence of the said decision-maker.

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45 See more in: B. Wiśniewski, J. Prońko, Reguły przeciwdziałania..., op. cit., p. 38.


