ULBS

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PhD Thesis

MANAGEMENT AND COMMUNICATION DURING ORGANIZATIONAL CRISES, BASED ON THE HOLONIC CONCEPT

- summary -

PhD candidate:

LEVENTE-ATTILA, BAKOS

Scientific supervisor:

Prof.univ.dr.DĂNUȚ-DUMITRU DUMITRAȘCU

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SUMMARY

The socio-economic and technological context, in which the different types of organizations must carry on their activity, requires rapid adaptability and long-term sustainability. The decisions needed to achieve this goal must be taken in conditions of uncertainty and within a very short timeframe. We are witnessing an explosion of information technology solutions that lead to major changes in the contemporary society, from changing market conditions - both in terms of consumer behavior and competitors - to major changes in technological and decision-making processes. Under the current dynamic conditions, there are chances that organizations will not be prepared for a new context, and the decisions made under pressure to lead to crisis situations.

Starting from the need for an interdisciplinary approach of crisis management, the thesis addresses the theme of risk and crisis management using methods of study of several scientific fields. The main objective of the research is the development of a management model based on a high degree of freedom of the component elements (subunits), with a control architecture / communication protocols that lead to an adaptive managerial act. The proposed research aims to find solutions for increasing the economic efficiency, the profitability of the economic organizations and improving the efficiency of the managerial decision act. The presented solutions are based on a concept based on the holon philosophy of Arthur Koesler, taken over by researchers and practitioners in the field of modeling adaptive complex systems. We consider that these fields, mainly engineering fields, as well as the field of information systems, can offer solutions for social sciences researches, respectively in our case, for the field of organization management.

In Part I, through the bibliographic study, we present benchmarks of the current state of knowledge. In principle, we can find three main areas of study: the holonic concept, risk management and crisis communication. In this part of the thesis, the scientific literature is presented regarding the current state of knowledge in these three distinct fields. The research topic demands this interdisciplinary study.

The holonic concept is analyzed from the perspective of the potential it can offer in finding solutions in the digitized world we live in. In the age of Internet of Things, Big Data, Industry 4.0 and other concepts, human-machine communication is a tool that comes to the

aid of those who handle crisis situations. At the same time, this era is itself a source of risks, which must be addressed in a new formula.

The other two chapters of the first part aim to show the current state of research and practical solutions in managing risks and crises. In order to provide solutions taken from the field of information technology and automation - the domains par excellence oriented to technical solutions - we must know how to approach crises and risks and from the social sciences point of view, too. In the proposed model we will take many ideas from machine-machine communication in the engineering fields, solutions that should be applied in the communication that also involves the human factor.

In Part II, the proposed research topic is presented. The research methods and means are identified. At the same time, the general objective and the specific objectives of the research are presented; respectively the hypotheses for the quantitative research are stated. The mixed research methods will result in a crisis management model, respectively, will result in a series of data obtained through qualitative and statistical methods that describe the management mode and the degree of preparedness for the crisis situations in the studied organizations. As it results from the problem tree drawn up in the preliminary research phase, an important element to address is the improvement of human-machine communication during crises. Improving human-machine communication not only means an improvement in the physical sense, measurable in units of time or percentages, but it also means a qualitative improvement. Through the stated research hypotheses we show that in the studied organizations the preparation for crisis situations is limited to certain predefined situations, the management is centralized, hierarchically. It also analyzes the extent to which the members of the organization resort to technological equipment and how inter-human communication is achieved through the use of IT equipment.

In Part III, the results of the research are presented. The various stages of research have generated a large amount of scientific data. One of the particularities of the proposed holonic structure consists of the possibility to issue reports, sometimes in few seconds after any incident, to certain stakeholders and emergency services without prior approval of the upper management levels. The structure created is an example of non-linear thinking that can introduce a new crisis approach to the organizations in which it is implemented. The developed communication protocol presents a holonic crisis management concept, which, unlike to most holonic architectures, is placed in a general organizational context. As such, it has a wide applicability in different types of organizations. These researches brought a

number of interesting conclusions, by themselves, but at the same time they provided input data needed to design to the later holonic model. Also, the qualitative research conducted on a sample of 151 respondents contributed to the construction of the holonic model, respectively validating the hypotheses formulated.

Four hypotheses were formulated in the research, all of which were validated by the investigations. Even if the studied sample is not representative the conclusions of the study have a certain scientific value. The qualitative and quantitative data were interpreted qualitatively, respectively, statistically analyzed through the IBM SPSS Statistics program.

In the last part of the thesis reffers to the conclusions of the entire research. Personal contributions and the perspectives of the research are summarized here. In this concluding part there are presented the modalities of how the results can be used for further researches or can provide support to different organizations. A synthesis regarding the dissemination of the results is provided. The dissemination of results will further continue. The developed holonic model in a certain extent is being implemented in some of the studied industrial organizations. The research topic is still challenging, there are several prospective paths to follow.

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CONCLUSIONS. CONTRIBUTIONS, PERSPECTIVES

The main conclusions and recommendations regarding the current state of scientific knowledge in the field of holonic concept, crisis management and crisis communication are:

- following the analysis of the scientific literature, we found that the holonic philosophy in the scientific works of the field of organization and business management is represented in a much lesser extent than in the technical fields (engineering and systems modeling, manufacturing control, software engineering and others);

- the application of the holonic concept is found to go beyond the organizational framework of a single organization, but it remains the deep technical character of the research, so we consider that there are perspectives regarding the applicability of the holonic concept in the management of organizations;

- we noticed that holonic philosophy has great potential in offering solutions in the digitalized world we live in;

- risk management the lack of specific knowledge, a loose organizational culture inevitably leads to high risk tolerance;

- the analysis of the state of the knowledge in the field of crisis management and crisis communication showed that there is a shift of the focus from the orientation on the damage control to an approach oriented to managing the reputation and increasing resilience;

- the lack of internal regulation of a crisis situation does not exempt the persons involved from liability, including criminal liability being possible in extreme situations;

- crisis management performance is strongly influenced by efficient human-machine communication;

- crisis management involves a lot of communication, efficient collaboration within a group of people, often ad-hoc format;

- the communication modalities existing in the usual practice are focused on inter-human communication, and do not explicitly address human-machine communication, in these situations;

- human-machine communication is a tool that comes to the aid of those who manage crisis situations, but at the same time this era represents a source of risks, which must be addressed in a new formula;

- following the interdisciplinary study we consider that crisis situations can be managed successfully if we create stable autonomous entities within the organization during the crises;

- incidents of any kind must be seen as a reason for reorganization and adaptation to change.

The main conclusions and recommendations regarding the study of crisis management and crisis communication, through mixed research methods and holonic modeling

- the mixed methods used showed unequivocally the need for information, education of the personnel of the organizations regarding the role and the general competences of the different departments, respectively the need to improve the interdepartmental communication;

- the mixed research carried out showed a discrepancy of perception between the top managers and the other categories of personnel, on how to manage a crisis situation and the competences of the persons involved;

- following the factor analysis, through the components method, we have shown that the members of the organization, apart from the top managers, do not have the will and the maturity necessary to be involved in solving crisis situations;

  - as a result of applying the method of analysis of the main components we can say with certainty that in the studied organizations the employees are not prepared to handle situations for which they do not have predefined tasks, they do not have the necessary competences to manage the crises and they will avoid to get involved in crisis management;

- we recommend establishing at the level of organizations the integration of the human-machine relationship in the working procedures of the organization;

- we recommend organizations to allocate resources for staff familiarization with the existing methods for crisis management, respectively developing skills for managing unforeseen situations that lead to an active attitude in these situations, even in the absence of senior management.

- we also recommend that the technical staff be aware that crisis management means not only process management and damage control, but also reputation management.

The research validated the following hypotheses:

Hypothesis no.1 *In the studied organizations the preparation for the crisis situations is summarized in the management of the situations that can be solved on the basis of predetermined protocols*

The respondents agreed with the assumption that the organization is prepared for the forecasted situations, is not prepared for the unforeseen situations, respectively for the situations with high impact, but low probability, they could not formulate a coherent opinion. Thus, we conclude that the respondents do not know how to proceed, so implicitly the organization is not prepared for these situations. Taking into account the values determined by the factorial analysis of the main components on the crisis management performance based on predetermined protocols, we can conclude that the research hypothesis no.1 can be considered confirmed.

Hypothesis no.2 *In the studied organizations the non-executive members of the organization do not have the necessary professional maturity to manage a crisis situation.*

The respondents were divided into two categories, based on the defined factors: staff with active behaviour and staff with passive behaviour during. The passive ones were automatically considered not enough mature to address a crisis. Those respondents characterized by an active attitude had statistically not valid behavior in the described situations, when they were asked about their readiness to violate certain internal rules. Thus, it is also confirmed by this factor that the members of the organization have an ambiguous behavior. Taking into account the results were obtained by comparing several answers, we

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consider that the hypothesis is confirmed: in crisis situations the non-executive members do not have the professional maturity to manage a crisis situation.

Hypothesis no.3 *Within the studied organizations crisis situations are managed centrally, hierarchically at the top management level.*

The statistical analysis found that there is no significant difference in the answers given by the respondents, regardless of which group they belong to and what managerial level we discuss. Thus, we can say with certainty that in the studied organizations, the crisis situations are managed centrally, hierarchically, by the senior management levels. Both analysis groups – named top management level and middle management level-, agreed with the fact that crisis situations must be managed by higher levels. However, as an interesting fact, it was found that the respondents largely agreed with the fact that the situation should be managed by the managers at the level of the department where the situation appeared, and not by the top management level. This result leads us to the conclusion that the respondents formulated the answers based on their own experience. All respondents agreed that the crisis situations should be managed hierarchically. Taking into account the above, we can consider hypothesis 3 validated.

Hypothesis no. 4 *In a complex organization in crisis situations the members of the organization will rely on technological equipment only for a small extent.*

Following the statistical analysis of the data from the questionnaires we found that we have a significant difference regarding the theoretical opinion expressed regarding the efficiency of the IT means and that of a concrete situation, where the effective communication method is considered to be the verbal one. Due to the inconclusiveness of the answers obtained, we consider that the hypothesis no.4 according to which in a complex organization, in crisis situations, the members of the organization will rely on technological communication equipments only in a small extent.

Some of the research results, have been published in different scientific papers. There were 6 scientific papers presented in international conferences and journals:

Bakos L., Dumitraşcu D*., Possibilities to Extend the Holonic Manufacturing Concept to Non-Industrial Environments*. In: Paola Dameri, Ricardo Spinelli (ed.): ECISM 2017 11th European Conference on Information Systems Management, Genoa, Academic Conferences and Publishing Ltd, 2017, pag. 331–341., ISBN 978-1-911218-52-4

Bakos L., Dumitrașcu D.D*: Holonic Handling the Unexpected in Project Management*. In: Lucian Kifor, Norbert Grünwald, Lucian Lobonț (ed.): Creating a mindset for growth and socio-economic development, Sibiu, „Lucian Blaga" University of Sibiu, 2017, pag. 142–148., ISSN 1843-6730

Bakos L., Dumitrașcu D.D.: *Holonic Crisis Handling Model for Corporate Sustainability,* Sustainability, Vol. 9, No 2266, 2017, pag. 1–23, IF: 2,582

Bakos, L, Dumitrașcu, D.D: *Crisis Management Between Public Relations and the Holonic Multi-Agent Approach*, Procedia - Social and behavioral sciences, Vol. 238, No 238, 2018, ISSN 1877-0428, pag. 527–534.

Bakos, L., Dumitrașcu, D.D*.: Holonic crisis management case study using problem tree analysis*, International Journal of Economics and Management Systems, Ed. IARAS, Cyprus, Vol. 1, 2018

Bakos L., Dumitrașcu D.D.: *Organization Research Using Design-oriented Research Methods: Case Study on a Holonic Based Crisis Communication Protocol* Proceedings of 18th European Conference on Research Methodology for Business and Management Studies ECRM 2019, 20-21 June 2019, Johannesburg, South Africa, Academic Conferences and Publishing International Limited, 2019

Bakos, L., Dumitrașcu, D.D., Harangus, K.: *Human factor preparedness for decentralized crisis management and communication in cyber-physical systems, (*article in press at Sustainability, journal of MDPI)

Limitations

Same to other studies, this research has its limitations. First of all the size of the sample, the restricted number of companies from only two industries, located nearby each to other, certainly represents limitations of the research. Therefore, it would be interesting to compare the results of the present study with the results from less standardized industries and/or to extend the research to a much broader geographical area. The size of the existing sample is a sufficient number for the experimental set-up of this study, but larger samples shall be used in further research. Certainly represents a limitation of the present study the fact that over 80% the participants have technical background, attribute that definitively influence their behaviour under unpredicted circumstances. Future research should more explore other staff categories from these industrial organizations. Obviously, some of these limitations may set the future research directions.