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PRINCIPLES OF CRISIS COMMUNICATION AND INFORMATION VULNERABILITIES IN CRISIS MANAGEMENT

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Abstract

Modern man is constantly under enormous time and financial pressure, increased uncertainty, and a significantly multiplied frequency of change. It must integrate new knowledge or information into the functional flow of personal or professional life. The ongoing crisis further escalates this. Therefore, an information-based society requires each member to pass on the correct information to the right people at the right time. The article discusses information behaviour in crisis management. Above all, he pays attention to the basic principles of crisis communication, describes the tools of crisis communication, and explains the basic concepts of information ecology, which is also crucial in crisis management. The final section deals with information vulnerabilities that can occur in the information environment of crisis management.

Keywords: Crisis communication; information vulnerability; information ecology; crisis management.

1. Introduction

Crisis and emergencies such as conflicts, natural disasters, accidents, terrorist attacks, or also problems of social, economic, political and psychological problems are an inescapable part of human life. They impact not only the environment in which individuals' function but also the individual's physiological, affective, and social well-being. Crises drastically change the context of all individual and collective actions, including information activities. Crises and disasters disrupt our routines and condition our information behaviour, becoming more dynamic and sometimes chaotic while remaining focused on eliminating the problem to sustain and ultimately overcome the crisis. Information behaviour often becomes extremely varied and subject to many factors due to the sudden nature of a crisis or catastrophe. She tends to be anxious, determined by emotion, and time-sensitive [1]. A crisis is an experience and an event or situation that is usually unexpected, accidental, unacceptable, unprecedented, and often impervious. In addition, it has a significant impact on social values and can reduce trust; it can trigger dangerous responses such as riots and wars that threaten the lives of many communities [2]. A crisis can also be a kind of stimulus that triggers specific information behaviour [3]. The crisis is the context for all possible activities, including solutions [4]. Disaster is often defined by its disruptive impact on entire communities, countries, and the natural environment. This phenomenon is hazardous: it can cause a fatal disruption of

social order and harmony and a sense of helplessness in individuals who lose their sense of security due to damage to property, loss of health, or economic and environmental impacts [2].

Crises and disasters undoubtedly affect a person's informational behaviour. In a crisis situation, habits often change as individuals adapt their active and passive processes of gathering information, seeking and retrieving information and using or disseminating information. Managing these situations well by individuals, both on the part of the recipients of the information and the part of producers of the information, requires successful crisis communication and management of the transmission of information. Thus, a little-discovered information ecology field infiltrates the crisis management field.

This article aims to broaden the horizons and try to define the intersections of the fields of crisis communication and information ecology and point out the connections. The goal is also to find vulnerabilities in the information environment of crisis communication.

2. Crisis Communication

The academic dictionary of foreign words explains the notion of conflict as a conflict of conflicting, conflicting interests, etc. Conflict is an integral part of our lives, and conflict resolution is one of the most common communication activities in our professional and private lives. The same dictionary interprets the concept of crisis as a moment of maximum contradiction, a decisive break. Disaster is defined here as a disaster, an event with tragic consequences.

There may or may not be a causal link between conflict and crisis. For example, it can be said that an unresolved conflict can turn into a crisis because the balance previously maintained by the ongoing resolution of conflict situations has been lost. An uncontrolled crisis will gain momentum on its own and could turn into a disaster. However, natural disasters, in particular, can strike without warning. However, crises or disasters cannot be seen as single negative phenomena because they can be seen as opportunities and lead to improved measures. [5]

Crisis communication has a similar organizational objective to crisis management during a crisis. However, its primary focus is on gathering, coordinating, and disseminating information and views related to the crisis to stakeholders on time in order to protect and defend the organization in publicly questioning its reputation [6]

Communication is crucial in times of crisis. If crisis management forces did not have prepared crisis scenarios for how to communicate during these situations, they are likely to cause even more damage. In the absence of adequate internal and external communication:

- The operational response will disintegrate.
- Stakeholders will not know what is happening and quickly be confused and react incorrectly.
- The ingredients will be perceived as incompetent.
- The time taken to resolve the issue fully will be extended.
- The effects on financial losses will be more severe. [7]

Crisis communication aims to provide timely, reliable, and persuasive information at the right time and place to achieve rapid and professional preparedness of all authorities and elements of crisis management (German, 1999).

3. Principles and methods of crisis communication in an integrated rescue system

The primary prerequisite and basis for effective emergency response are to ensure reliable communication between the different components of the integrated rescue system and the authorities involved in coordinating rescue and disposal efforts. For this reason so-called crisis communication is used in preparation for emergencies and emergencies. Crisis communication, in this case, means the transmission of information between public authorities and components of an integrated rescue system using voice and data transmission via a telecommunications network, public, and selected parts of a non-public communications network.

The Ministry of the Interior provides technical means for crisis communication; it is also obliged to allow crisis communication between authorities and components of the telecommunications network according to the unique implementation of the Ministry of the Interior. Communication service providers are asked to cooperate with the Ministry of the Interior, which determines the continuity of the telephone line service for this number, in the preparation and resolution of means of communication on a single European crisis and emergency number. Anyone involved in crisis communications using appropriate technical equipment should be available within their jurisdiction when the emergency is declared or in their rescue and disposal, providing, where appropriate, statutory synergies.

Crisis communication in the integrated rescue system is organized according to needs into three levels of coordination (tactical, operational, and strategic) between ministries, ministries, other central administrative offices, competent authorities at the level of counties, or administrative offices at the level of districts. Extended municipalities, regional and municipal governments, as well as within each of these entities

For crisis communication, the following are used:

- Telecommunications networks specially designed by the Ministry of the Interior used to secure voice and data communications as well as to connect the integrated safety system's public radio communication network, operate and serve to operate the integrated safety system's public radio communication network;
- An integrated rescue system radiocommunication network set up by the Ministry of Interior for the regular operation of the components;
- A fixed public telecommunications network with priority connectivity;
- public mobile telecommunications network;
- A mobile network reserved and earmarked to ensure links between emergency management authorities and municipalities;
- A radio network to transmit messages to be used in the event of a failure of all technologies;
- Mobile telecommunications networks and equipment can only be permitted if the capacity of standard means of communication is damaged. [8]

1.1. Crisis communication in crashes and disasters

Time plays a vital role in the emergence of accidents and disasters. As a result, sudden and unexpected emergencies are arising with very rapid developments, including irreversible damage to company property and people's health or property damage. In this context, every organization must also be aware of its social responsibility towards its surroundings. Each organization positively and negatively impacts its surroundings through its activities. Crisis communication is seen here as a tool used by the organization in situations where it threatens or harms its surroundings with its activities, such as crashes, by releasing harmful substances. [9]

1.2. Communication in a process crisis

Crisis communication procedural has specific characteristics and differences from communication in accidents and disasters. This is a crucial crisis management tool in times of acute crisis, when a company may face financial problems that may affect not only employees but also contractors, state governments, banks, and other institutions. There is more time for communication in a procedural crisis than in the event of an accident and disaster, but this does not mean that crisis communication should be postponed. [10]

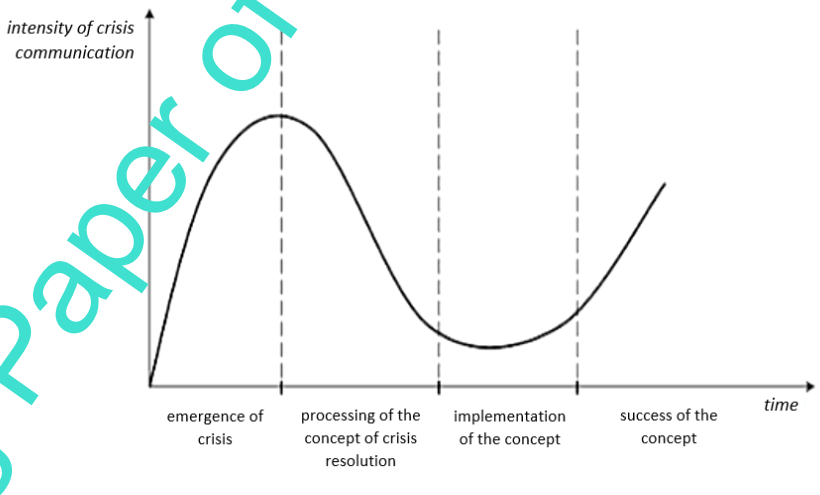

Fig. 1. The course of crisis communication [9]

1.3. Successful Crisis Communication

In rapid expression and subsequent reflection, the most challenging element of crisis communication is a ready response with a reasonable and accurate response. In emergencies, a late or disproportionate response may cause a negative response from the recipient of the information. This can cause embarrassment and lead to legal action by the

company and any interested parties. Effective crisis communication is used to explain the impact of a crisis. The impact can also be mitigated by a timely response to, or even before, the crisis. It is, therefore, a positive approach to effective crisis communication. During a crisis, how communication is handled can positively and negatively affect the organization's future.

An effective crisis communication program should reflect the organization's requirements (standards) and expectations. This is also reflected in the perception of all target groups. Crisis communication should also include managing the causes of the crisis, helping victims of the crisis, communicating with staff and stakeholders, and communicating with the public in a timely and accurate manner. [11]

Communication aims to pass on as much memorable information as possible to the audience. Knowledge of the other side is the basis of successful crisis communication. Here is a rundown of what is recommended for drafting the report:

- Provide messages that promote kindness, openness, and interaction,
- reports should not contain technical data and information,
- messages should build credibility,
- limit information to three main messages,
- reports must be structured, organized, and concise. [12]

1.4. Crisis Communication Planning

Since the crisis, in most cases, attracts the public's attention, it is necessary to create a crisis communication plan. We must be prepared for a crisis. However, crisis communication cannot be done based on current feelings. It must be managed and based on specific established rules and principles. Planning crisis communication is a long-term process based on estimating the likelihood of adverse events occurring and influencing people's behaviour. It includes activities to develop basic communication strategies and key messages for all target groups.

The general process of planning crisis communication should be as follows:

- Awareness of opportunities in terms of crisis communication objectives, media, social priorities, finances, international commitments, etc.
- Analysis and comparison of possible crises – analysis of the nature of risks, identification of actors in individual communication circles, analysis, and description of possible crises.
- Determination of essential elements of crisis communication – the quality of a relationship, information design, and dialogue design.
- Defining the total area of crisis communication – pre-crisis, crisis, and post-crisis communication.
- Selection and comparison of possible alternatives to achieve the goals.
- Development of a crisis communication plan. [12]

4. Information ecology

Information ecology protects the organization's information environment and its interconnected system of social, cultural, and political subsystems within the organization, the information ecology approach affects the information that is generated, stored, and made available. It focuses primarily on the human factor, not just technology. Constant developments and changes in the organization's environment are also considered.

The essence of information ecology is based on classical biological ecology. Therefore, the term can be understood similarly to classical ecology. Furthermore, given the previous definitions, we can see this, on the one hand, as an approach to the protection, study and application of the principles of information ecology. Furthermore, information ecology can also be understood as an indication of the relationship between elements and components of the information environment and their interactions. [13]

The best approaches to information ecology and understanding can be used where we are most often found, where we play some active social role, hold some function, have some specific opinions, and can comment on what is happening there. It is an environment we know well, and we can recognize the appropriate technologies and techniques we can use to improve the functioning of this environment. It can be a different place for everyone: work, school, home, library, hospital, church, club, community centre, or civic association. Much depends on our local experiences, practices, goals, and values associated with the place, whether as individuals, organizations, or as a group. [14]

1.5. Information behaviour

Informative behaviour includes knowingly seeking information, a range of unintentional or passive behaviour, and behaviour unrelated to information retrieval, such as deliberately avoiding certain information. Information avoidance is a phenomenon that is also studied as part of information behaviour - it is generally thought that when searching for information, people tend to seek out information that is consistent with their knowledge, beliefs, and beliefs, their current beliefs and opinions, and try to avoid contradictory information. On the other hand, a high level of interest in a subject tends to increase the "exposure" of certain information - people with a high level of interest are motivated to gather more information on a topic of interest to them. [15]

We distinguish three levels of related terms. General information behaviour (when using information, communicating, and solving common problems), information behaviour in active and targeted information retrieval, and user exploratory interaction with a system or service. This is the third informative behaviour as an action. [16]

The following model shows this in a simplified way.

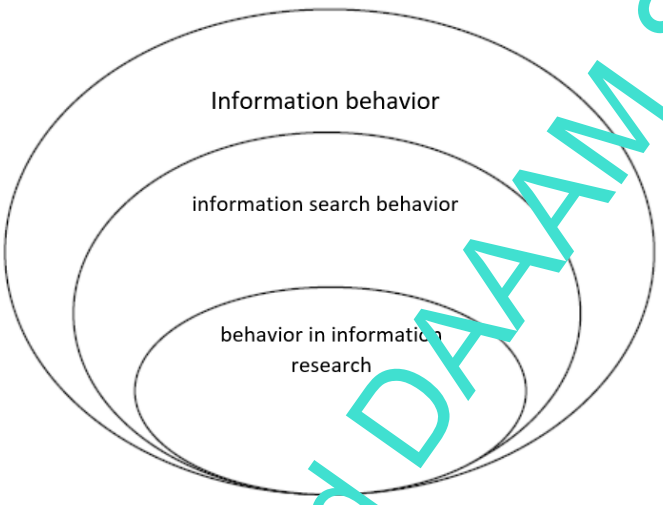

Fig. 2. Model of information behaviour [16]

1.6. Concepts of information behaviour

The field of information behaviour is often associated with many other concepts from the area in which information operates. These include, for example, the area of decision-making (evaluation and selection between different options; identification of problems that concern us) – it is characteristic of some professions, leadership positions, etc., and there is a large amount of research informing the behaviour of these groups.

Another concept associated with information behaviour is the problem of information overload. This is a state where an individual cannot process such information. The most common situation where information overload can occur is searching for information on the Internet. Information overload can result from actively searching for information and passively receiving the information we already have without asking for it (spam, advertising, etc.). [15]

When exposed to large amounts of information, the human body reacts in different ways – for example, we choose which information to pay attention to and distinguish between what we need to know and what we "just" want to know or are interested in. By selective selection, we can determine seven different categories – of possible reactions of the body to supersaturation:

- omission – failure to process some inputs and stimuli;
- error – errors in processing information,
- sequential processing (queuing) – deliberate delay in the processing of some information to catch up over time,
- filtering – processing only information that is identified as high-priority information,
- approximation – lowering the standards of differentiation of individual information by reducing the accuracy of the evaluation of inputs and outputs,
- different channels – division of incoming information (inputs) into smaller units in order to divide responses (outputs),
- escaping – completely ignoring incoming information.

Information poverty can be defined as a state of an individual/group in which the following characteristics are fully or partially met:

- poor ability to process information (lack of comprehension or reading, speech/language impairment, hearing or vision impairment),
- the social situation in a minority culture, which (usually) leads to a misunderstanding of information known to the public, reliance on oral and traditional information, or media to transmit information in a more common form;
- fatalistic tendencies or helplessness, reducing the likelihood of positive information behaviour.

The term digital divide refers to the gap between those with regular and functional access to digital and information technology and those without. The approach involves one's technologies but, more generally, the resources and competencies needed to participate effectively in digital communication (e.g., the most severe problem is currently insufficient or underdeveloped infrastructure). [17]

5. Information vulnerabilities in crisis management

Safety plays a significant role in society. One of the crucial elements of an organization is its information environment. In an organization, security ensures that conditions are protected so that it can perform its intended function. A prerequisite for ensuring security is the identification of vulnerabilities in the information environment concerning the security environment and the organization itself.

1.7. Information overload

Decision-makers have limited cognitive ability to process information. Information overload occurs precisely when the amount of information exceeds this capacity. If there is a situation where whistle-blowers are overwhelmed, the quality of their decision-making may decrease. The problem of information overload arose during the Renaissance and industrial revolutions. However, with the information age and access to automated and efficient data collection that provides more information, the severity of this problem has increased.

1.8. Informational multitasking

Some people are very proud of their "multitasking" skills. Especially women, who are said to be doing well because the two hemispheres of their brains are more closely connected. If a person is constantly bombarded with information from different sources simultaneously, he cannot properly concentrate on them. It also affects short- and long-term memory and flexibility in solving new problems. Statistically, such people change jobs less frequently, even if they feel bored in their current job and it does not fulfil their career or financial dreams.

1.9. Inefficient way of working with information

The human brain works with information nonlinearly, using connections and the ability to see connections in a broader whole. Being able to accurately process and quickly find a large amount of information at any time is an increasingly important skill in the work of all managers. The most important thing is to be able to orient yourself, choose an excellent source of information, and meet the needs related to the performance of the task or the solution to the given task.

1.10. Little motivation to process information

Low motivation or demotivation is caused by a sense of threat, manifested mainly by concentration on one's problems, limited concentration on receiving new information, performance, inability to think creatively and find solutions, and searching for "escape" from the environment of receiving, processing, and remembering information.

1.11. Information fragmentation

Fragmentation of information that does not provide the full context of events and their interrelationships, which are generated by many different sources of information, leads to a fragmented perception of reality in many people. This may be the reason for their childlike view of reality. Especially at the moment, this damaging phenomenon is more noticeable and noticeable.

1.12. Chaotic organization of information

The problem is when a worker gets lost in the flood of documents and information and does not know where to find the necessary content or what version of the document is correct. The absence of information when it is just needed.

1.13. Verification of information

Much information appears in the information space. They attack us from all sides, and it is not very easy to navigate in them. Some information seems subliminally to us without us being aware of it. An essential skill of people is to be able to resist influences and to be able to filter out information. In other words, to distinguish between those who are sincere and those whose intention is to manipulate.

1.14. Unavailability of information

The absence of information can cause stress and uncertainty and create room for speculation.

1.15. Misunderstanding of information

Misunderstanding can be understood as something often unreflective, something we are unaware of. We have limited means of language and communication to convey what we think and imagine. The transmission of information always entails communication noises. An important aspect is also the information literacy of the individual.

1.16. Communication barrier

In the process of communication (i.e., mutual sharing – communicating/receiving information), obstacles, i.e., communication barriers, are sometimes unavoidable. They interrupt successful communication. The obstacles to communication are as diverse and enduring as human communication itself. In some situations, the obstacles can be so severe that they cause armed conflict.

6. Quantification and evaluation of vulnerabilities

This chapter aims to quantify and evaluate vulnerabilities and their impact on the organization's operation. For the expert assessment, the assessment method will be chosen on a scale of 1-4; this scale will further assign vulnerability values, percentage expression of the problem, and verbal expression.

Degree	Abbreviation	Vulnerability	Expression in %	
			from	to
1	L	low	0 %	25 %
2	M	medium	26 %	50 %
3	H	high	51 %	75 %
4	C	critical	76 %	100 %

Table 1. Degrees of vulnerability and expression of vulnerability

Vulnerability description	Degree
Information overload	4
Informational multitasking	3
Inefficient way of working with information	1
Little motivation to process information	1
Information fragmentation	2
Chaotic organization of information	2
Verification of information	1
Unavailability of information	3
Misunderstanding of information	2
Communication barrier	2

Table 2. Description of vulnerabilities with expression of degree

Degree	Verbal expression
1	The vulnerability does not pose a particular security problem for the organization. The operation of the organization is not compromised. Special measures need not be introduced; they can be consciously accepted.
2	The vulnerability is a security problem for the organization, the operation of the organization is not

	significantly compromised, but the problem needs to be paid attention to and addressed.
3	A vulnerability is a security problem for the organization. The operation of the organization may be compromised. The problem needs to be addressed and given long-term attention.
4	Vulnerability represents an acute security problem for the operation of the organization. The operation of the organization is threatened. The problem must be solved and eliminated.

Table 3. Degrees of vulnerability and verbal expression

5. Conclusion

This article may be the first step towards a descriptive, conceptual analysis of the current state of information behaviour in crisis management. He gathered existing definitions in the fields of crisis communication and information ecology, the relationship between these disciplines, and created a brief overview of knowledge, a collection of terminology for future research. Informative behaviour in a crisis, which often occurs under the pressure of time, involves evaluating and responding immediately to existing circumstances.

Many factors influence the collection and use of information, as well as other activities such as information avoidance and information manipulation; they also change the role of chance in information gathering. Information barriers that can occur in crises and information needs changes are still not given enough attention.

Simple quantification and evaluation of vulnerabilities are the basis for further research into different information activities in crises of different types. This article dealt only with selected major crisis management and information ecology chapters and provided the basis for further research.

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7. References

[1] Allen, D., Karanasios, S. & Slavova, M. (2011). Working with activity theory: Context, technology, and information behavior, Journal of the American Society for Information Science and Technology, Vol. 62, No. 4, pp. 776-788., ISSN 1532-2882, DOI 10.1002/asi.21441

[2] Al-Rahmi, W. M., Alias, N., Othman, M. S., Marin, V. & Tur, G. (2018). A model of factors affecting learning performance through the use of social media in Malaysian higher education, Computers & Education, Vol. 121, pp. 59-72., ISSN 0360-1315, DOI 10.1016/j.compedu.2018.02.010

[3] Krakowska, M. (2020). Information behavior in crisis situations, Zagadnienia Informacji Naukowej - Studia Informacyjne, Vol. 58, No. 2A (116A), pp. 61-85., ISSN 2392-2648, DOI 10.36702/zin.716

[4] Goodman, M., Pang, A., Begum, N. & Chee Yang Chong, A. (2014). Negotiating crisis in the social media environment, Corporate Communications: An International Journal, Vol. 19, No. 1, pp. 96-118., ISSN 1356-3289, DOI 10.1108/CCIJ-09-2013-0064

[5] Holladay, S. J. (2012). The handbook of crisis communication, Wiley-Blackwell, ISBN 978-144-4361-902, Hoboken, New Jersey, United States

[6] Tomsu, M. & Pekaj, R. (2021). Information Support for Crisis Management in the Zlin Region with a Focus on Meteorological Information, Proceedings of the 32nd DAAAM International Symposium, pp.0701-0711, B. Katalinic (Ed.), Published by DAAAM International, ISBN 978-3-902734-33-4, ISSN 1726-9679, Vienna, Austria, DOI: 10.2507/32nd.daaam.proceedings.098

[7] Nemec, P. (1999). Public relations: communication in conflict and crisis situations, Management Press, ISBN 8085943662, Prague, Czech Republic

[8] Hovk, P.; Krc, M.; Ondrus, R. & Danelova, L. (2004). Crisis Management Guide for Public Administration, Linde Prague, ISBN 80-7201-471-4, Prague, Czech Republic

[9] Zizak, R. & Königova, M. (2009). Business crisis management 2, Grada, ISBN 978-80-247-3156-8, Prague, Czech Republic

[10] Zapletalova, S. (2012). Business crisis management for the 21st century, Ekopress, ISBN 978-80-86929-85-9, Prague, Czech Republic

[11] Walker, D. (2012). Mass Notification and Crisis Communications: Planning, Preparedness, and Systems, CRC Press, ISBN 978-80-86929-85-9, Boca Raton, Florida, United States
[12] Vymetal, S. (2009). Crisis communication and risk communication, Grada, ISBN 978-80-247-2510-9, Prague, Czech Republic
[13] Nardi, B. A. & O'Day V. L. (2000). Information Ecologies: Using Technology with Heart Paperback, MIT Press, ISBN 978-0262640428, Cambridge, Massachusetts, United States
[14] Rankov, P. (2006). Information society - perspectives, problems, paradoxes, Koloman Kertész Bagala, ISBN 8089129919, Bratislava, Slovakia
[15] Steinerova, J. (2005). Information behavior: perspectives from information science, Center for scientific and technical information, ISBN 80-85165-90-2, Bratislava, Slovakia
[16] Wilson, T. D. (1999). Models in information behaviour research, Journal of Documentation, Vol. 55, No. 3, pp. 249-270., ISSN 0022-0418, DOI 10.1108/EUM0000000007145
[17] Kuhlthau, C. C. (2004). Seeking meaning: A process approach to library and information services, Libraries Unlimited, ISBN 1-59158-094-3, London, United Kingdom