STUDY ON CRISIS COMMUNICATION TOOLS IN TERMS OF RESCUE NEEDS IN POLAND

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Abstract - Crisis communication plays crucial role in rescue units responding for most present-day threats.Ithas influence on safety and security of people as well as the responders. Complexity of object tools that are used in very different operational circumstances forces a necessity to develop a novel approach related to common understanding of social and technical solutions in crisis communication. This paper aims at identification of rescue needs as well as most popular crisis communication tools. Implementation of morphological approachallowsto take all of them into consideration. Peer-compare technique is used for assessment of the needs and the tools giving unique appropriation profile. The profilevisualizes crisis communication potential in specific rescue context due to particular tools. It states foundations for framework conception of optimal crisis communication in rescue units owning to external and internal determinants and possibilities.

Keywords - Crisis Communication, Rescue, Communication Tool.

I. INTRODUCTION

Fires, floods, strong winds, earthquakes, tsunamis, accidents with hazardous materials (HazMat) and other general security threats have significant influence for local societies (Sawada, 2017). Additionally, they can affect also organizations dedicated to help people, property and environmental resources in case of emergency.

Character of the threats affection is usually very complex and multilateral. Not only organizational reputation is in danger then (Coombs, 2007; Pattriotta, Gond & Schultz, 2011; van der Meer & Verhoeven, 2014). Although unacceptable low level of the outsidemembers' perception of rescue entity image (Dutton, Dukerich, &Harquail, 1994) is undesirable from operational perspective, also physically impact is worth to be mentioned (Heath & Millar, 2004), especially as far as rescue continuity is concerned (Gromek, 2016).

Because rescue entities (fire services, police forces, water rescue units, mountain rescue units, communal emergency services etc.) are obligated to operate facing such negatively perceived conditions, relevant procedures and good practices should be elaborated and practically implemented. Crisis communication seems to be this kind of issue, which is characterized by relatively high potential of the operations efficiency determination (Coombs, 2011; Fearn-Banks, 2011).It is justified by the facts, that proper communication can be done by major crisis managers in many different ways (Fekete, 2012) and favors to involve citizens in the threat response (Haer, Botzen&Aerts, 2016).

Actual theory and practice of crisis communication are very wide sources of information regarding to object means and manners. Exemplifying, following tactics can be enumerated: news conference, press release, fact sheet, questions and answers (Q&A), memo, letter and Internet response (Taylor & Perry, 2005). The last one can be operationalized by direct messages (via e-mail), blog, chat, Twitter, Facebook etc. (Utz, Schultz &Glocka, 2013) as a result of supporting role of new technologies in communication processes (Toya & Skidmore, 2015).

Furthermore, many scientific attempts for crisis communication optimization also have been done.Among the others, Blumenstock, Eagle and Fafchamps describe airtime transfers (Blumenstock, Eagle &Fafchamps, 2016), Lee highlights important reasons for proactive crisis communication (Lee, 2016) andPreece, Show and Hayashi implement Viable System Model to analyze communication structures (Preece, Show & Hayashi, 2015). Additionally, Strategy Map for Crisis Communication (Kadarova et al., 2015) and guidelines for political crisis communication need to be mentioned (Ewart, McLean & Ames, 2016).

Preliminary analysis of crisis communication tools visualize that they can be collected into two main groups: technological one and social one. Most of them are enough universal, that can be transferred into almost every institution (organization). Thus, making them coherent and holistic requires a novel, integrated approach. It is especially noticeableand justified in case of emergency, when rescue entities operate.

Facing abovementioned expectations, I make a study on crisis communication tools (both social and technical ones) in the context of operational rescue circumstances. I take legal tasks of crucialPolish rescue organizations as reference point for the rescue needs specification. The next step relies on identification of most popular crisis communication tools that are (and can be) used by rescue practitioners (managers and executors).Basing on morphological approach, the two groups of the tools are taken into account by peer-compare technique to appoint them ranges referring to their usefulness in analyzed context. Consequently, I obtain unique appropriation profile which concerns potential of particular tools for meeting rescue needs and state

foundations for framework conception of optimal crisis communication in rescue units owning to identified determinants and possibilities. The conception assumptions are presented as a final part of this paper.

II. METHODOLOGY

2.1. Identification of rescue needs

Regarding to popular meaning, rescue need is defined as something essential or very important for normal existence and/or proper functioning in previously specified context (Oxford Free English Dictionary). When general security threat occurs, this context is often characterized by urgency, instant danger to people life and necessity of conducting the response by specialized and well-equipped rescue organizations. Their legal tasks constitute foundations of rescue needs. In other words, rescue needs stem directly from the tasks and the relevant information sources are acts and executory laws constituting formal background for rescue operations. Fig.1. presents this conception schematically.

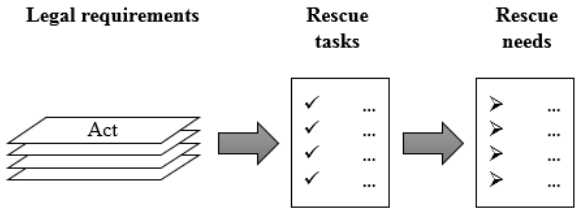

Fig. 1. Conception of rescue needs identification

2.2. Crisis communication tools in two-dimensional approach

Crisis communication is defined as information transfer in circumstances of crisis situations and/or crisis. Thus, it exceeds from standard rescue operational conditions, aiming at dysfunctional influence of the threats on local societies (rescue entities included). Object tools can be presented in two dimensions: social and technical.

Technical tools base on communication technologies that are used at the rescue action field, in staff offices, crisis management centres etc. (Skorupski&Krawczyk, 2016). The social dimension is comprised by intangible issues which whole spectrum can be ascribed to public relations (PR) solutions.

Accordingly to presented division, identification of crisis communication tools should be done as a result of rational implementation of social and technical solutions into rescue problematic aspect, respecting its legal and practical requirements.

2.3. Optimization of crisis communication process

Awareness of rescue needs and crisis communication tools allows for make a next step to elaborate assumptions for novel approach of optimal crisis communication in rescue units. For this purpose, assessment of the needs and tools ought to be carried out. Referring to analyzed literature, there are many lacks of expertise and scientific background (especially in Poland)due to describing problematic aspect. This is why looking for holistic and coherent conception can be named as 'a wicked problem', with potential solutions located in classical decision theory.

Morphological approach is an one of the manners for solving wicked problems (Ritchey, 2011). Citing its developer, "within the final and true world image everything is related to everything, and nothing can be discarded a priori as being unimportant" (Zwicky, 1969). Above assumption justifies an usage of morphological way of thinking in analysis of crisis communication process. It can be very helpful, because it expresses holism and makes possible to take into consideration all communication determinants (elements). There are described needs and tools – same important from theoretical and practical points of view. Fig. 2 shows analytical matrix, which bases on abovementioned assumptions.

	Social tools				Technical tools			
	S-Tool 1	S-Tool 2	S-Tool …	S-Tool ‚m'	T-Tool 1	T-Tool 2	T-Tool …	T-Tool ‚o'
Need no.1								
Need no.2								
Need no.3								
Need no…								
Need no.'n'								

Fig. 2. Template of matrix for crisis communication analysis

The matrix implementation gives total amount of analytical areas expressed by following equation:

$$A_{total} = n \cdot (m + o) \qquad (1)$$

Where:

A_{total} total amount of analytical areas,
n number of rescue needs,
m number of social tools,
o number of technical tools.

It can be used as conceptual support, keeping in mind that every time some elements will be analyzed, it should be done in relation with all the other elements.

Morphological context creates research framework for the needs and tools assessment. Owning to 'the wicked problem' characteristics, also relatively simple solution for determinants ordering should be implemented. Peer-compare technique meets this requirement. It relies on one-by-one comparing of all elements, asking question about which of them is more important (suitable) from previously defined perspective. All answers are collected in peer-compare matrix for assess relevant ranges (Gromek, 2017). Fig. 3 presents this conception.

	Need 1	Need 2	Need 3	Need 4	Need 5	Need 6	Sume	Range
Need 1		1	1	0	1	0	3	0.20
Need 2	0		1	1	1	1	4	0.27
Need 3	0	0		0	0	1	1	0.07
Need 4	1	0	1		1	0	3	0.20
Need 5	0	0	1	0		1	2	0.13
Need 6	1	0	0	1	0		2	0.13

Fig. 3. Example of peer-compare technique matrix

Exemplifying, '1' in a cell crossed by 'Need 1' and 'Need 3'above the grey line means that the first one is more important that the second one.
In this research peer-compare technique serves for assessment of:

1. Ranges characterizing particular rescue needs in terms of their importance from practical, crisis communication point of view,
2. Ranges reflecting availability of particular crisis communication tools in relation to particular rescue needs.

Individual appropriation measure for particular tool and particular need can be elaborated from the equation:

$$p_{tool,need} = r_{need} \cdot r_{tool,need} \quad (2)$$

where:

$p_{tool,need}$ availability potential of tool,
r_{need} range of need,
$r_{tool,need}$ range of toolin context of need.

Awareness concerning individual appropriation of the tools is crucial for profiling relevant potential and formulating foundations for framework conception of optimal crisis communication in rescue units.

III. RESULTS

3.1. General rescue needs in Poland

Legal requirements determining Polish rescue operations are collected in more than 80 acts and executory laws (Gromek, 2015). Their detailed analysis in the light of rescue tasks identification allows to enumerate following, general catalogue of rescue needs in case of emergency:
Need 1 Efficient emergency warning of rescue entities
Need 2 Immediate disposal of first responders' units
Need 3 Urgent identification of threat that initialized the rescue response and creation of first situational awareness
Need 4 Preliminary appointment of danger zone
Need 5 Isolation of the danger zone
Need 6 People warning
Need 7 Threats prediction and creation of general situational awareness
Need 8 Permanent monitoring of resources efficiency
Need 9 Effective cooperation and commanding
Need 10 Reduction of the threats' influence
The numbers serve only for ordering reason. It is truly hard to prioritize particular needs in the optics of their importance as they commonly state operational rescue structure. However, it can be done in crisis communication context.
Ranges characterizing particular rescue needs are able to be obtained with the use of peer-compare technique. Accordingly to the rescue communication specification, its practical implementation ought to reflect a question: In which need the crisis communication aspects are practically more important for more efficient rescue response? Fig. 4 presents results of relevant 90 elementary analysis.

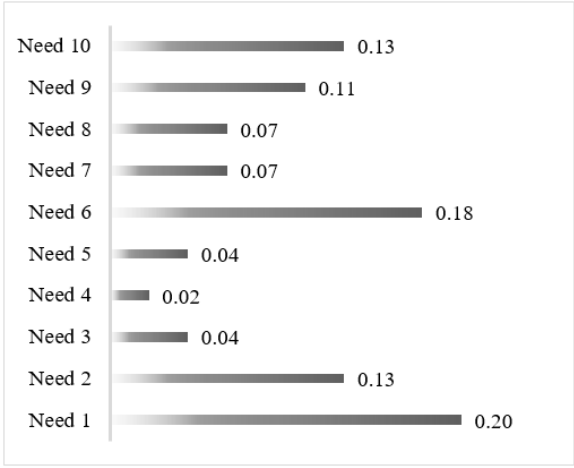

Fig. 4. Ranges of rescue needs (r_{need}) due to influence potential of crisis communication aspects

Focusing on results, crisis communication aspects are practically the most important for rescue response in case of need respecting efficient emergency warning of rescue entities and people in danger. Additionally, these two determinants seem to reflect actual understanding of crisis communication phenomenon in Poland. One need to remember, that lower impact for other determinants does not mean no possibilities for crisis communication. It depends generally on operational circumstances and available communication tools. Nevertheless, most crucial information concerns usually first stage of emergency response and this conclusion create a background for further research.

3.2. Crisis communication tools for Polish rescue practitioners

Rescue practitioners are comprised by crisis managers (public administration bodies), fire brigades, police units, voluntary rescue organizations, communal rescue units etc. Respecting legal and practical requirements, most of them have an access to many technical crisis communication tools. In

Poland the most common arei.a. (Skorupski&Krawczyk, 2016):

Tool 1 National Warning System – GSM system transferring SMS information concerning unusual situations from sender to registered receivers,
Tool 2 Regional Warning System – warning system dedicated for people staying on territory of province, organized as an one-way communication manner, which allows to inform about threats by crisis management centres using websites, television, mobile applications,
Tool 3 Council SMS Informer– warning system dedicated for people staying on territory of district, organized as an one-way communication manner, which allows to inform by SMS,
Tool 4 Commanding Support System (SWD-PRM) – insulated IT system organizing communication between medical dispatchers, medical rescue units and medical rescue coordinators,
Tool 5 Decision Support System (SWD-ST) – insulated IT system supporting operational issues for the State Fire Service units,
Tool 6 System for selective warning of voluntary fire service units in the National Firefighting Rescue System – the system bases on GSM technology implemented for sending messages or initiating phone connections by crisis management centres,
Tool 7 system for operational support for voluntary fire service – refers to parallel informing about an accident voluntary firefighter who can confirm their readiness to action via mobile phone,
Tool 8 TETRA (Terrestrial Trunked Radio) – modern and open standard of digital communication operationalized as dispatchers' communication manner,
Tool 9 Central Reporting Application – web tool developed for crisis management reporting by public administration bodies,
Tool 10 Local System of Warning and Forecast – Internet platform related to hydrological and meteorological information in open access formula, limited to chosen administration territories,
Tool 11 websites of rescue institutions (management and executory ones) – mostly one-direction communication manners with relatively static character, and also, suchPR (social) good practices as:
Tool 12 news conference – organized by rescue practitioners
Tool 13 press release – short message sent by media to social receivers,
Tool 14 media interview – direct meeting with media representative to share crucial information (often at the accident field).

It is worth to emphasize that media convergence allows to integrate particular crisis communication tools into one, multi-tool solutions. This phenomenon becomes also an integrator of technical and social manners in analyzed context.

3.3. Crisis communication tools and rescue needs in Poland

Basing on SWOT analysis of chosen crisis communication tools (Skorupski&Krawczyk, 2016), peer-compare technique is used for ranging the tools due to their appropriation for rescue needs. Essential question that should be asked for this method purpose is: Which crisis communication tool has higher potential of effectiveness influence for rescue operation in case of emergency due to advisable rescue need? Fig. 5 presents the results ($r_{tool,need}$), which reflects appropriation potential in describing context referring to "(2)". It bases on 1820 elementary analysis (comparisons).
Using these values, unique appropriation profile which concerns potential of particular tools for meeting rescue needs is elaborated. Fig. 6 presents them graphically.

CONCLUSIONS

Crisis communication tools were studied in terms of rescue needs. Consequently, major conclusions can be formulated as follows:

1. Crisis communication theory and practice deliver many useful solutions from rescue perspective. This is very positive situation leading to complex operational possibilities but generates many, potentially also negative consequences (e.g. difficulties with use of many/all of crisis communication tools as well as their different communication potential). Thus, need for holistic approach is noticeable.
2. Importance of crisis communication aspects is determined by rescue needs and crisis communication tools. The most important needs concern efficient emergency warning of rescue entities as well as people in danger.

	Need 1	Need 2	Need 3	Need 4	Need 5
Tool 1	0.01758	0.00879	0.00098	0.00049	0.00342
Tool 2	0.01978	0.01172	0.00537	0.00244	0.00439
Tool 3	0.01538	0.00733	0.00098	0.00024	0.00342
Tool 4	0.02417	0.01612	0.00342	0.00219	0.00342
Tool 5	0.02637	0.01758	0.00586	0.00293	0.00537
Tool 6	0.02199	0.01465	0.00391	0.00244	0.00391
Tool 7	0.01099	0.01319	0.00098	0.00049	0.00195
Tool 8	0.02857	0.01905	0.00342	0.00293	0.00635
Tool 9	0.01319	0.00879	0.00586	0.00195	0.00049
Tool 10	0.00879	0.00733	0.00537	0.00195	0.00000
Tool 11	0.00000	0.00000	0.00195	0.00098	0.00244
Tool 12	0.00439	0.00293	0.00244	0.00098	0.00195
Tool 13	0.00219	0.00147	0.00098	0.00049	0.00147
Tool 14	0.00659	0.00439	0.00293	0.00171	0.00586

Tool 1	0.02344	0.00073	0.00146	0.00244	0.00879
Tool 2	0.02149	0.00586	0.00366	0.00488	0.01758
Tool 3	0.01954	0.00000	0.00073	0.00366	0.01172
Tool 4	0.00586	0.00439	0.00366	0.00977	0.01172
Tool 5	0.00781	0.00733	0.00659	0.01343	0.01465
Tool 6	0.00977	0.00586	0.00586	0.00855	0.01026
Tool 7	0.00977	0.00219	0.00439	0.00611	0.00439
Tool 8	0.00391	0.00879	0.00952	0.01587	0.01465
Tool 9	0.00586	0.00952	0.00733	0.01221	0.00733
Tool 10	0.00195	0.00439	0.00147	0.00000	0.00733
Tool 11	0.00977	0.00219	0.00147	0.00122	0.00000
Tool 12	0.01758	0.00513	0.00879	0.01221	0.00439
Tool 13	0.01563	0.00219	0.00366	0.00733	0.00147
Tool 14	0.02539	0.00806	0.00806	0.01343	0.01905

Fig. 5. Ranges of crisis communication tools in the light of rescue needs

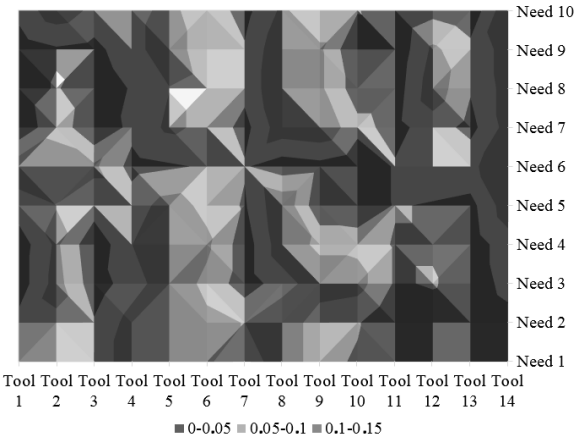

Fig. 6. Appropriation profiles of crisis management tools (related to $r_{tool,need}$)

3. Crisis communication phenomenon in emergency operations does not seriously concern organizational reputation of rescue entities. The main attention is focused on efficient help to people in dander.
4. Results of tools potential assessment visualizes that during first phases of emergency response the most appropriate are dispatcher systems dedicated for urgent warning and support rescue action organization.
5. From people warning point of view, commonly accessible solutions are worth to be mentioned, because of their potential for making danger zone isolated from additional witnesses. Accordingly to other rescue needs, they are useful in very limited range.
6. Province level of security management is quite characteristic, because of complex crisis communication possibilities. Accessible technical tools have many functionalities dedicated to warning as well as collecting information.
7. The more time-consuming response, the higher necessity of monitoring tools implementation is observed.
8. Internet solutions and media relations manners are useful in perspective of both rescue entities and people warning.
9. Media interviews can be understood as reliable sources of information regarding to rescue resources inefficiency, rescue needs and threats prediction.
10. As dispatcher systems (Tool 4 and Tool 5) have access to information about experts, they can be used for situational awareness raising solutions at the beginning and, especially, during long rescue action.
11. TETRA system has complex functionalities which makes it very interesting platform facing most of the rescue needs.
12. Dispatcher systems and cooperation platforms (Tool 8 and Tool 9) have commonly the highest potential for threats reduction. It would important especially in case of additional threats occurrence and domino effect materialization.
13. Technical and social tools seem to meet each other. Their common implementation can influence for rescue action efficiency.
14. Further research in crisis communication problematic aspects is necessary to change so called 'wicked problems' into scientific knowledge. Morphological approach is prospectively useful.

The conclusions can be dealt with as foundations for framework conception of optimal crisis communication in rescue units owning to external and internal determinants and possibilities.

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