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Title: Mutual trust in the city strategy implementation

Year: 2022

Version: Accepted manuscript

Please cite the original version:

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Keywords: Strategy implementation, Preparedness process, Resource-based view, Joint performance

Abstract: This chapter describes benefits of simultaneous implementation of data co-production and co-processing in crisis management to carry out joint operations of city divisions. Operations are part of the preparedness process, which sustain situational awareness of the common resource-based view. Based on the action research, the choice of spreadsheet software was a function for emergency management team, which strengthen mutual trust of the team members. The use of tool brought benefits to the value chain securing by taking into account the customer-oriented functions of the city, and co-processed data analysing. The goal of the value chain securing is to maintain, for example, cost-effective, waste-free assistant logistics, which implements city strategy during the crisis. Experience-based information in the chapter is valuable to assess the implementation of the strategies, and to creating opportunities accelerate recovery from the crisis.

13.1 Introduction

Based on the Local Government Act, municipalities must produce financial statements annually. In accordance with the law, municipalities assess the impact of exceptional circumstances and the success of crisis management. The purpose of this chapter is to present the use of a spreadsheet-based situational log in a way, that develop mutual trust in order to simultaneously implement the security strategy of society and the city strategy.

The phenomenon under study is the action researcher's observation of knowledge management before and during the year 2020's Covid-19 crisis. The city's target organization reacts proactively to the threats. Performance has improved by joint exercises. The regions authorities with the city had conducted several readiness exercises in the previous year, analyzed these events and even produced an international research article on the metrics of the preparedness process (Vornanen & Takala, 2020). Collaboration had improved joint performance, and urgency was controlled. Neither time was the weakness of competitiveness factors nor costs or flexibility. A quality was. Unknown threat increased uncertainty about customer-oriented use of resources to achieve strategic goals. Increased need of knowledge management directed the search of solution models how measurement data should use in practice in a way that increases mutual trust.

Let us look at a slightly broader picture of the situational factors. The digitalization in the public environment has grown over the past decades, and simultaneously the criticality of digitalized services to service suppliers and customers has grown too. Digitalization taking place through community's servitization, more and more at the channels of social media. Municipalities are the platforms, and at the same time competitors of business investments and jobs which they create in the digital era. To control this balance in all circumstances, security management requires practical, trustful steps and collaboration to implement strategies of the cities. Planning and training build confidence in the successful implementation of the multi-strategies with the constantly evolving ability to secure value chains in every level of organization on the public platform. Performing joint operations share a common goal, as a mutually supportive and complementary process. Situational factors, their context and content, form the basis for the process control. The preparedness process is a sustained situational awareness of the common resource-based view (Barney, 1991; Wernerfelt, 1984).

The digital public environment include three levels: physical, logical, and user-level. Levels form a manageable context. The physical level includes touchable things such as buildings, furnitures, roads, bridges, trucks, surfaces, facemasks, network cables, and so on. The logical level controls the interaction with the physical level, including, for example, laws, codes, work safety policies, applications, software, and protocols. The user-level means high-performing people. The level consists of user-related details that connect individuals and organizations to interact through networks.

Where is the problem? High-performing people confidence to the crisis management will decreases if resources follow-up measures from the physical level does not support their continuity management responsibilities. At its meeting on Friday, March 11, the city's Emergency Management Team (later in the text EMT) notes, "*we have to shut down some public services in order to protect our residents*". The network of large Finnish cities has made similar observations. At this point, cities were not entitled to do so. In the evening of the same day, the Prime Minister of Finland spoke in a television interview about the activities of the public sector. She highlights the challenge of the activities of the EMT's city and the current situation as an example. On Monday, March 13, the Government, together with the President of Finland, state that there are exceptional circumstances in Finland. To manage the exceptional situation, Finnish society uses the Emergency Powers Act. The law gives the government temporary powers to bypass the fundamental rights of the individual to protect the entire community. Referring to joint experiences of history, Finnish society has a strong mutual trust in the force of this law.

Why look at the software choice from a logical and high-performing people's mutual trust-building perspective? First, because amount of resources are limited, unnecessary additional work increases costs and execution time, and finally reduces opportunities for development of competitiveness. Therefore, knowledge management procedures should add value to the situation and continuity management. If the crisis continues or expanding, the amount of un-analysed data will increase and the benefits created by the common forum during the crisis will be lost. The platform and collaboration methods on it should support and secure functionality of the value chains.

Secondly, spreadsheet software are widely in use, just like word processing and presentation graphics software. The advanced utilization of widely used, a standard-like tools is cost-effective and meaningful. Using a spreadsheet software as a situational log supports joint managerial actions. The spreadsheet measures the content written about the events. The measured and analyzed situational factors and operational priorities lead to common situational awareness, conclusions; decision-making; effective implementation of decisions; monitoring and learning from influences. (Vornanen, 2017)

The commonly agreed writing procedure is a base for value giving and use of the columns of the spreadsheet. With the help of review columns, the data written in the cells of a row can be filtered, grouped and classified, thus producing statistical information from qualitative data. Pivot tables help analyze the data collected in a spreadsheet software, study trends or frequencies, and present situational picture of direction of development. The EMT's advanced use of spreadsheet software develop collaboration and increases organization's competitiveness.

There is also personal interest for research, because exceptional circumstances are very rare possibilities, especially to action research. The corresponding author, as a director of the technical services division, is a member of the EMT. Action research is a research strategy that includes action development and influencing perceived problematic factors (Lewin, 1946). As stated in the phenomenon presentation above, the problem identified as a quality problem in the technical dimension of quality (Grönroos, 1984). The choice of an appropriate tool affects continuity management, first into analysis reliability and interpretation of the results, then to situational awareness, and decision-making ability. At worst, the risk remains that mistakes will recur. Uncertainties weaken psychological resilience during a crisis. Therefore, the choice is important.

13.2 Metodology

Actions with the Log data
The Act on the Openness of Government Activities, Section 24.1, 8. § underlines that documents concerning preparations for accidents and emergency conditions, are secret. Therefore, the study focused on public part of data of crisis management and describing the analysis of log data. The research subject of content analysis is a spreadsheet-based situational log. Content analysis included a quantitative and qualitative research. A quantitative analysis helps to find out the cause-and-effect relationships of phenomena, the connections between them or the frequency and occurrence of phenomena with the help of numbers and statistics. A qualitative analysis aims to understand the quality, properties and meanings of an object holistically. A both methods explain the same research subjects in different ways. The Log's data will grouped and categorized to highlight so-called PESTLE perspectives (Newton & Bristoll, 2013). In the study, a PESTLE is a framework tool used to identify, analyze, and organize factors of the city strategy. The framework builds a strategic crisis management model of Covid-19 threat from the legal, social, technological, environmental, political, and economic perspectives to develop continuity planning.

Actions with the target organization
In practice, the researcher's goal is to affect the procedures in the target organization by participating and influencing by example and leadership. The members of the EMT lead their processes. These city's core processes maintain the public environment as an operational platform for the residents. The platform forms from different kind of public services, such as buildings, streets, HVAC-, electric- and ICT-networks, ports, parks, sport facilities, and so on. Management measures occurs by the manner manager writes the date, personal initials, and situation-based activity information as well as any additional information about the command in the log. By common column content model, managers can copy data on their mobile phones or tablets to a common spreadsheet page of the information system. The city regulations define duties for EMT-managers. Their units implement the city strategy approved by the city council. Manager's preparedness planning and preventive actions are the way implement of the security strategy of society, both strategies at the same time. The outputs and impacts of the city's preparedness process can be describes as a matrix. As a horizontal input, the city's EMT monitors relevant situation factors, and as an output, the core functions and systems (processes) realized into operational reliability, which reduces uncertainty. As a vertical input EMT gathers and controls the platform's resources, quantity and quality of the service network based on situational awareness, to achieve as a vertical output necessary effects to common strategic goals through the core processes. A mayor, who introduces issues of strategic decision making to decision-makers, leads EMT. At the same time, he/she is a Chairman of the region's security and preparedness organization, which works with EMT in risk management activities.

Actions with the community
The assessment of the implementation of the city strategy in exceptional circumstances is justified because the Strategic Management Society of Finland awarded an honorary diploma for the City of Kotka's strategy and its implementation in 2018. On a Finnish scale, the strategy of the City of Kotka and its implementation are noteworthy and exceptional. The City of Kotka residents came up with ideas and highlighted what they considered important for the city. In exceptional circumstances, tasks in the processes will be adapted to the situation, for example by closing or concentrating some services together. Referring to the lessons learned from history, In Finland every lives matter. Securing the vital functions of society based on the concept for comprehensive security. The Finnish concept for comprehensive security means that the citizens, organizations, the business community and the authorities in collaboration secure society's vital functions, or in other words, the value chains on the platform. The key success factor is everyone is a security actor. Thus, joint performance of hybrid organization arises from the successful implementation of multi-strategies to manage a variety of threats. (Vornanen, 2017)

13.3 Results and discussion

Results from the Log data

The EMT's first Covid-19 related statistical signal is on January 22, one week before first disease case occurs in Finland. The organization has had time to review contingency plans, resources, and take the necessary operative actions before the declaration of exceptional circumstances. The exceptional situation lasted three month, from 13 March to 16 June 2020. The data cover the period from January to June, in which EMT produced 579 commands to the log. In the quantitative content analysis, their written log data grouped by four more manageable categories (Table 13.3). In the qualitative content analysis, the actions written in the log examined in relation to the city strategy and PESTLE-perspectives. Some of the cross-administrates measures targeted several strategic entities, and thus combined core processes and resources. In this case, the total sum of the log entries is larger than the sum of individual entries. Figure 13.3 summarizes the qualitative content analysis.

Table 13.3. Monthly variation in operating frequency (Own research).

| Category	Core functions and systems	Commands per Month					
		I	II	III	IV	V	VI
Management	Municipal management and decision-making, Payroll and financial management, Information management, and Communication and information	1	4	109	89	34	7
Well-being	Pre-primary education and early childhood education, Basic education, Primary health care, social security and social care, and Environmental health	-	-	59	86	28	1
Circular economy	Energy supply, Waste disposal, Water and wastewater supply, Logistics and public transportation	-	-	24	16	-	-
Critical services	Infrastructure maintenance, Building maintenance, Food services and catering, and Situational awareness	4	4	63	26	14	10
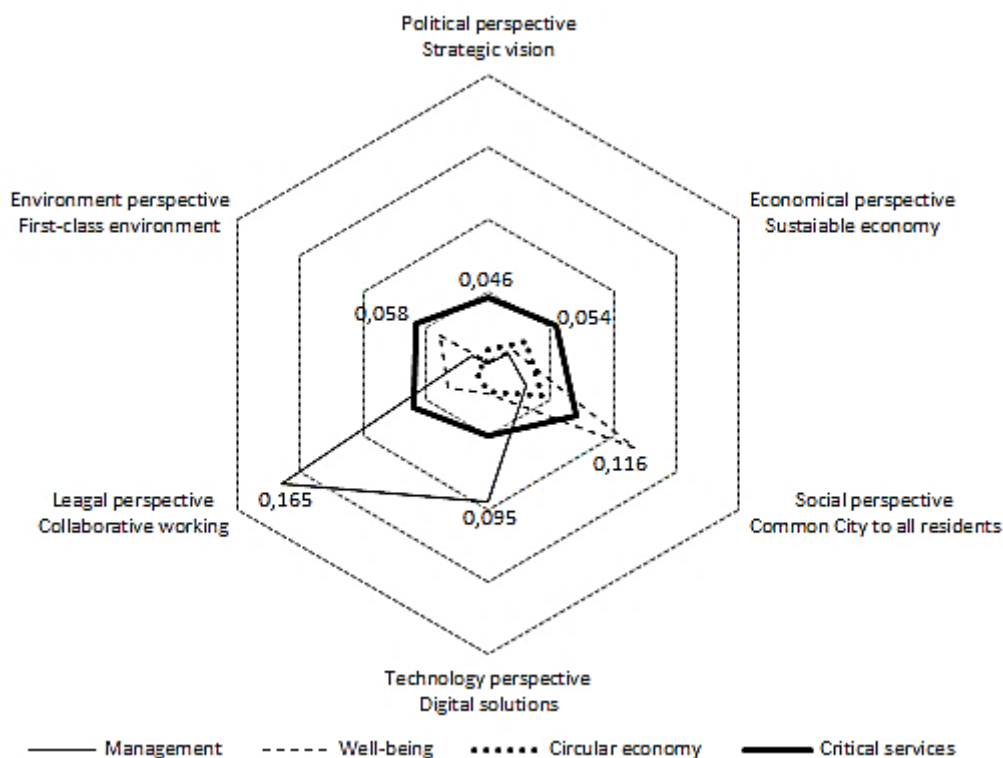
Figure 13.3. PESTLE-Strategy -diagram about the city's strategy implementation during Covid-19 crises (Own research).

From the point of view of joint efforts, the measurement results shows the balance of operations of critical services in relation to the PESTLE-perspectives, and at one time, the implementation of the city strategy. There are two highlighting perspectives from the content analysis: the common manageability and the desired social impacts. The diagram has value in securing the common value chains. There is a need to consider how to achieve the best possible customer-oriented outcome, how to add value to all residents.

Results from the target organization
On the proposal of the action researcher, the method of maintain the situation diary was changed in the target organization from separate pages of the word processing software to a use of spreadsheet software to manage possible long lasting continuum of the exceptional circumstances. The mutual trust created through the readiness exercises before disruption was beneficial.

When the crisis escalated, the mayor decided to include the Chairman of the City Board in the EMT. In this way, decision-makers were part of an operational activities and the team underwent continuous performance evaluation. The benefit for situational awareness by using spreadsheet software is that the chart and graphs are automatic updated every time data added. As a result, the performance of each member of EMT is equally important for the management of the whole, which strengthens mutual trust, and creates opportunities to recognize and build dynamic capabilities (Vornanen & Takala, 2014).

The author concludes that the above-mentioned PESTLE-Strategy -diagram is a pandemic local threat profile. It refers to observations of EMT made after the first wave of crisis, and in the beginning of second wave. A pandemic seems to be by nature a hybrid threat that generates a wide variety of indirect effects. For example, activities that require human control and supervision may require isolating or work phasing solutions to protect service continuum. Therefore, there is a risk that increasing the steps in the processes will increase variability in the whole service network, threatening to increase execution time and costs.

The impact of the pandemic was on human supply chains and logistics services. The group size and mutual distances influenced residents gathering. Findings on the characteristics and influences of the pandemic evaluated together of the joint performance of the target organization and its service network. The need for a new type of services testing and training space that offers different conditions and changes became clear.

Results from the community
State-organized measures against Covid-19 threat included mandatory and voluntary quarantine, closure of state borders, and territorial isolation. The content analysis of the EMT log describes city's action. EMT maintained situational awareness, informed residents and led operations in the city. These included among others, the addition of handwashing points, the transition to teleworking, the closure of certain public services, and unauthorized access to technical services division bases prevented.

Municipalities have a lot in common, and in some cases different core functions. For example, coastal municipalities may have port functions that inland municipalities do not have. During the crisis, some key public services such as schools and sports facilities closed. In the target organization, the closing time of services was utilized flexibly for cleaning, maintenance and construction work.

The results of the action research presented to the Safety Park project's steering group on October 30. At the meeting were represented several public organizations: City of Kotka, Southeast Finland Police Department, Carelia Brigade, Army Academy, Finnish Border Guard, Kymenlaakso Fire Department, Merikotka Maritime Safety and Transport Research Center, University of Applied Sciences of Southeast Finland, and the Federation of municipalities in Social and Health services in the region of Kymenlaakso. There were private organizations as well: Port of HaminaKotka Ltd, Image Wear Ltd, Innocode Ltd, and Steveco Ltd. The steering group was pleased with the presentation and especially the city council's decisions.

Above-mentioned extensive co-operation started at the beginning 2019 to establish the Southeast Finland Safety Park, which promotes a change in the safety culture in the city's port and industrial areas ecosystem.

This forthcoming safety park, as its project phase, is already unique in Finland. It brings together all security actors in the region to manage comprehensive security. The need of change arises from megatrends such as the inevitability of an energy revolution, the integration of technology into everything and the adaptation of the community to climate change. (Vornanen & Takala, 2020)

During the crisis, EMT monitored the variation in the number of employees. In this way, it was possible to react to changes in the demand for services. By reducing the amount of variation, had the potential to affect the flow efficiency of the preparedness process. A temporary, employee-based resource bank for new crisis-related tasks were established. For example, a new task was to distribute school meals to schoolchildren's families with volunteers.

The quality of services monitoring based on feedback from residents. Feedback channels included the city's website and social media channels. According to author's observations, residents were satisfied with the services.

13.4 Conclusions and recommendations

Conclusion
The limitations are as follows. The action research of mutual trust examines only one city's EMT. It is too early to reflect on success in all situations. The Covid-19 crisis continues globally. Referring to CDC (Centers for Disease Control and Prevention, 2021) more rapidly infectious variants of the SARS-CoV-2 virus are emerging. The third wave of the Covid-19 crisis is possible (Murovska, Sokolovska, Sultanova & Cistjakovs, 2020). Asynchronized vaccinations have uncertainties (Jeyanatham, M., Afkhami, S., Smaill, F., Miller, M.S., Lichty, B.D. & Xing, Z., 2020). The threat itself, uncertainties and time-criticalness characterize strategic crisis management, and thus, the future we can see. Despite of these, the future direction of mutual trust research is to look at the interoperability of a larger entity that the local level.

The new thing that the chapter brings to strengthen mutual trust in theory and practise is as follows. Management and recovery from the crisis requires monitoring of situational factors and constant securing of value chains. The selection and use of a standard tool facilitates the simultaneous production and processing of data. The procedure promotes the management of time-critical activities and cumulates the development of organization's core competencies to add value.

Referring Hämeri & Gahmberg (2020), in an uncertain world, the importance of science is emphasized. This action research utilizes the management of production economics in public operational impacts and achievement of community's well-being goals. EMT has used a spreadsheet-based situational log for crowdsource-based knowledge management purposes (Vornanen, Sivula & Takala, 2016). Co-producing and co-processing of data have been simultaneous activities. The implementation method of security strategy of society and the city strategy leaves no space for fake news. The choice of the tool has been of fundamental important for EMT's mutual trust and joint efforts in extreme situations.

According to Hall & Saias (1980) the 'structure follows the strategy' operation principle, the technical director concluded that the target organization had to restructure to achieve new kind of goals and respond to rising threats. Therefore, a new manufacturing strategy planned for the division. It take place by evaluating the structures and resources, processes and workflows, organizational and information system through success, are they relevant to experience or has they capabilities to fulfil new expectations. The experience of the Covid-19 crisis will utilize as a driver for technology management. The city council approved technical director's organizational restructuring proposal (70 §), and over 900 000 EUR security investment to develop hybrid organization's competitiveness (71 §). The city acquired a large port building to the safety park purposes for the developing common safety culture (72 §). These decisions verify mutual trust in a resource-based approach.

Recommendations

From the point of view of the successful management of a hybrid organization, it is desirable that local organization has its own strategic knowledge management team, which also designs and coordinates local data's collection, for example, against combined threat situations. In this way, a quantitative content analysis serves the construction of common resource-based view, maintenance of situational awareness, and even the state's decision-making.

When using word processing or presentation graphics software as situation diaries, the compilation of situation factors and other data material has to transfer to spreadsheet software to produce situational picture or to do analyses. It is desirable that spreadsheet software be a common tool with pre-agreed column entries before, during, and through the observations, including after the crisis. From the point of view of continuity management, it is advantageous that in the preparedness process, situational factors and operational priorities are continuously analysed from a sense-and-response perspective (Vornanen, Liu & Takala, 2013).

Although the author paints a picture of an analytically implemented shared leadership tactic in the target organization, the qualitative material from EMT's diary with author's observations conveys a more realistic picture of the mayor's management in the Covid-19 crisis. In a situation where residents' concerns are need to listen and encourage towards a common goal, caring and communicating it is wisdom. The mayor plays a leading part in team communicating the direction of development convincingly, usefully and inspiringly to residents. Leadership is relevant and, depending on the situation, even critical to the success of strategies. The target organization had the right leader in the right place at the right time.

The actions of the mayor had an inspiring effect on the EMT and its joint performance. The choice of right tool have been affect to cooperation as a team's key instrument to tell, to crowdsource, to measure, and to analyze strategic actions. Utilizing the tool have help to strengthening mutual trust, which promoted the resilience. The implementation of the city strategy was successful by identifying welfare-critical choices and the use of resources to manage the crisis and accelerate recovery from the exceptional circumstances.

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