

P10

Situation Officers in the Centre of Gravity of Information Flows

Rauno Kuusisto
The Finnish Defence Forces, Finland

Tuija Kuusisto
The Finnish Defence Forces, Finland

Janne Huhtakallio
State Treasury, Finland

Abstract

This paper documents the second part of three-phased study about the management of information flows concerning situation awareness in military units. This paper is the continuation of two papers published in 3rd European Conference on Information Warfare and Security, July 2004. Those papers introduced the theoretical construction of the overall study. The main theory is based on the philosophy of social systems described in the theory of communicative act by Jurgen Habermas (1984, 1989) The aim of this paper is to introduce empirical results about managing information flows in the situation centre of the headquarters of combined arms. First, a brief introduction of the concept of situation officer and the theoretical background are introduced. Second, the method of this study is described. Third, the results are introduced and conclusions are made. Three main items was studied: What medias are used to transfer information in situation centres, from where this information originates and where it is transferred, and what can be concluded about situational information in the context of information operations? The main research method was survey complemented by interviews and observations.

Keywords

Information management, information flow, information operations, situation awareness

INTRODUCTION

Motivation

The motivation of this overall study raises from the needs to be more skilful to exploit information on the modern battlefield – whether it is “traditional”, network-based or containing fuzzy divergence of non-linear threats. This paper deals with information flows as a part of planning and decision-making process. This paper is the second part of three-phased study. It introduces the empirical phase of studying information flows and activities of the situation officer. The theoretical background of this study is published in two papers, the first dealing with the concept of situation officer (Kuusisto, Huhtakallio and Kuusisto 2004) and the second one the categorization of information in a social system (Kuusisto, Nyberg and Virtanen 2004). The main research questions of this study are:

1. What kind of communication medias do the situation officers use?
2. How the information flows take shape in the situation centres?
3. What can be concluded about situational information in the context of information operations?

The situation centre forms the ever-updating picture of the situation by combining the incoming information about the ongoing situation and distributing this picture to the higher echelon, subordinate units and its own headquarters' decision-making process. The situation centre makes available the information about “what is taking place and where”. The concept of situation officer gains to reduce the communication and need to react for present moment issues between higher and lower organization levels, as well as to direct mutual resources as quickly as possible. In time-critical situations information should flow only on and to the right level. The commander and the planning organisation should not be burdened with too detailed information. The situation officer acts as a “filter”, allowing each level to concentrate on their core tasks. Situation officers are positioned in the situation centre at the headquarters. The structure of the situation centre contains the situation master, situation officers and information interfaces. The situation master leads and manages the action of the situation centre.

Description of the theory basis

The theory basis of this study is constructed around Jurgen Habermas's thoughts of social systems. (Habermas 1984, 1989) These thoughts are reinforced with the theories of information, information management, and information refining in thinking process. Information, and information and knowledge management are discussed e.g. in (Appelhans, et.al 1999), (Awad and Ghaziri 2003), (Choo 1998), (Nonaka and Takeuchi 1995) and (Polanyi 1966). From the basis of those theories, the main idea concerning our study is that the overall world is full of various information that will affect the action of the whole interacting system while moving from one entity to another. Precaution for this is that information is relevant, understood and interpreted correctly in the situation, where interacting parties are acting. Information can be data, information and knowledge. Information can be expressed explicitly or it can be tacit knowledge of an actor, thus having effects on both interpretations of incoming information and actions put into practice on the basis of that information.

Refining process of all available information inside an active entity is reflected to thoughts and theories presented by (Bergson 1911), (Damasio 1999), (Maier 2002) and (Merleau-Ponty 1968). The focal point concerning information refining is that information between entities is transferred as data. The data are connected to the possessing information context of an entity, and new information and eventually knowledge emerges by this information connection and understanding process. According to Maier, "knowledge comprises all cognitive expectancies that an individual or organisational actor uses to interpret situations and to generate activities, behaviour and solutions no matter whether these expectancies are rational or used intentionally". In cognitive expectancies "observations have been meaningfully organised, accumulated and embedded in a context through experience, communication, or inference". (Maier 2002, 66) Knowledge grows through the whole life of an entity, and all new perceptions are interpreted against this organised, understood and accepted field of information. Incoming information is interpreted through a mental filter, which consists of internalised and abstracted perception history of the entity. This process is dealt with (Kuusisto and Kuusisto 2003), as well.

According to Habermas, the lifeworld is a structure of knowledge against which the interpretation of communicated information is completed. It consists of culturally transmitted and linguistically organised stock of interpretative patterns. The lifeworld is situated in the background of an interacting entity. It is the knowledge-based frame of cultural assumptions and individual experiences, valuations, and know-how, which are unquestionable in the beginning of the problem situation. "The lifeworld will appear as a horizon forming context of processes of reaching understanding." (Habermas 1989, 135) The lifeworld is the overall subjective frame of knowledge, against which the interpretation of incoming and the filtering of outgoing information is made. The lifeworld is assumed to be the "fixing point" of interactive event. It is the knowledge-based forum, where communicative parties can meet to make their information exchange to befall the requirements of mutually understandable real world consisting of subjective, objective and social sub-worlds. (Habermas 1989, 124 - 126) Subjective world contains all information, which is at the moment in the possession of one entity. It contains memories, perceptions and futures assumptions. Social world contains information about those rules, which confines mutual information exchange and objective world contains the information potential of the overall world. The concept of lifeworld can be considered as a helpful tool, when discussing about such situations, where purposeful actions will occur. It is a "static" frame against which the consideration of events may be constructed.

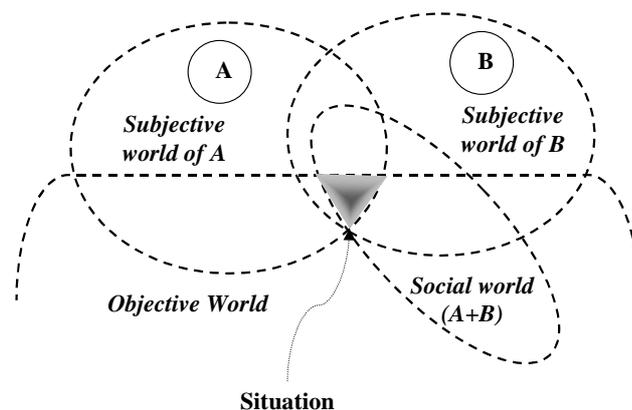


Figure 1. The concept of situation (Kuusisto, et al 2004)

"A situation is a segment of the lifeworld contexts of relevance." The situation represents a part of the lifeworld delimited by interests and aims of at least one participant. (See figure 1.) The concept of situation assumes that someone of interacting entities has aims, which can be realised as relevant through the interpretation of the situation. The situation is expressed via goals and plans of action in a context of something understandably relevant. This context is

determined and ordered concentrically and thus the longer the spatial-temporal or social distance is, the more difficult the situations are to understand. (Habermas 1989, 122 – 127) It could be concluded that if situations concern something that is not relevant to the subject, it is hard to understand. To gain mutual understanding, a lot of information shall be transferred. If incoming information is at the level of data and mutual interpretation constructions differ a lot from each other, the orientation for situation will be most difficult and it takes a great deal of time.

From the viewpoint of information, the lifeworld is a structure of knowledge, via which the information potential of the world will be outlined. The lifeworld confines the possibilities to use the information potential, which is present spatial-temporally in both the subjective and the objective world. It sets the boundaries within information can be understood and used. In military context, the lifeworld contains e.g. all information and knowledge considering military competence. This sets demands to the competence of the situation officer, as well. Situation is a structure of knowledge, which has potential to have effects on the world. It contains interpretation of relevant information and goals, as well as plans that express the will to put something in practice. Situation is spatially-temporally-knowledgeably limited space, where entity's aims are realized as relevant via interpretation of all information, which is bound on this situation. This information is both perceived by an entity and existing inside an entity. Existing information contains both competence and lessons learned about previous situations. This is most relevant to form a coherent basis of mutual knowledge of all actors. Perceived information acts as a trigger to realize locally situated, existing knowledge to perform activity to effect on the world. Perceived information is most relevant to accomplish such activity. Perceived information shall contain only such items, which are relevant to deal with the situation at each level.

Habermas states that there are four basic classes of information, which are directing an actor's activity. These are values, norms, goals, and perceived facts as well as means and resources. Those items contain information, which – when used – will orient an actor to adapt its behaviour to better fit the entity. Information concerning values will determine a general subsystem of culture. The function of culture is to maintain certain patterns of activity (Habermas (1989, 216 – 219). Information about values forms the long-lasting basis of information creation. Norms will determine mutually expected rules, among which the subjects of community will perform their interactions (Habermas 1989, 32 – 42). Goals will determine the desired end-state of actions. Goals are directing resources and means to gain success as effectively as possible. Means, resources and facts are used to put such activity in practice that leads the actor to fulfil its goals as optimally as possible. Table 1. depicts these dependencies.

Table 1. Information concerning action orientation and functions in a social system (Habermas 1989, 243, Figure 32)

INFORMATION CONCERNING ACTION ORIENTATION	FUNCTIONS THAT WILL USE THE INFORMATION
Values	Pattern maintenance
Norms	Integration
Goals	Goal attainment
Means, resources, facts	Adaptation

RESEARCH SITUATION AND THE METHOD

The empirical part of this research was completed during combat exercise on May 2004 in southern part of Finland. The idea of the study was to find out how information in the boarder line of the headquarters and the combat units and other headquarters is made available to use for the headquarters planning process and for the subordinate units, the neighbouring units and the higher echelon. Situation centres of three headquarters ("A", "P" and "H") were studied. Figure 2 shows the structure. Situation centres were situated in every headquarters and they formed the boarder line of perceptions of the headquarters concerning either incoming or released situational information. Every situation centre working-shift contained some situation officers lead by the situation master. Personnel were student officers of the National Defence College like cadets and general staff officer students, other student officers, as well as reserve officers. The research phase took two days and nights and it was completed in the later mid-phase of the eight-day exercise. This part of exercise was optimum to gather empirical data. The orientation phase was over and people working together had formed their mutual routines, and ongoing situation was fierce enough to provide as relevant data as possible about information flows. The main method was a survey that was directed to the situation officers and situation masters. To brighten the principles of interpreting the surveyed data the survey was supplemented by interviewing the key actors, and observing the working procedures in situation centres.

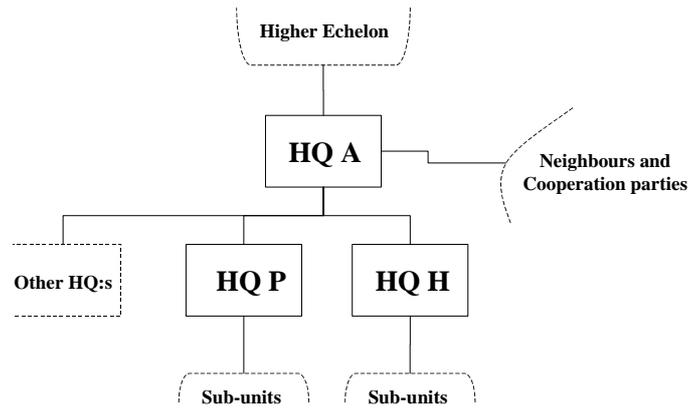


Figure 2. The structure of the research situation

SITUATION INFORMATION FLOWS

Using medias

The situation officers were asked to evaluate what is the relative amount of the use of different communication medias when receiving and distributing information. Four medias could be chosen: Face to face, paper maps, communication equipment (like telephone, radio, fax) and computer based information systems. The results of those evaluations are depicted in figures 3 and 4. The overall sample of 56 answers divided about equally between the three headquarters. The variance of answers was about 70% of each relative amount. Because the sample is so small in numbers very profound conclusions cannot be made. Anyhow, it seems that when considering incoming information, all three headquarters seemed to act equally. About two thirds of information was received via technological systems and one third via discussions, briefings and maps. When considering outgoing information, some divergence can be found between the headquarters. In A and P the situation was equal to incoming information, but H acted divergently. At headquarters H a lot of information releasing activities of the situation centre took place in discussions and briefings around the map.

Using technical means to make information available gives more time for the planning process. On the other hand, face-to-face discussions are essential to refine all incoming information to form a situational picture. The tacit knowledge about the features, the action patterns and the possible courses of action of all parties percolates with incoming situational data to be expressed explicitly at least some degree.

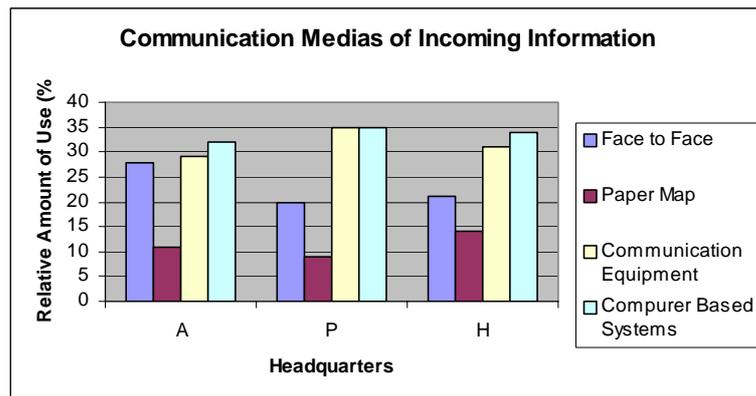


Figure 3. The relative amount of using medias concerning incoming information of the situation officer

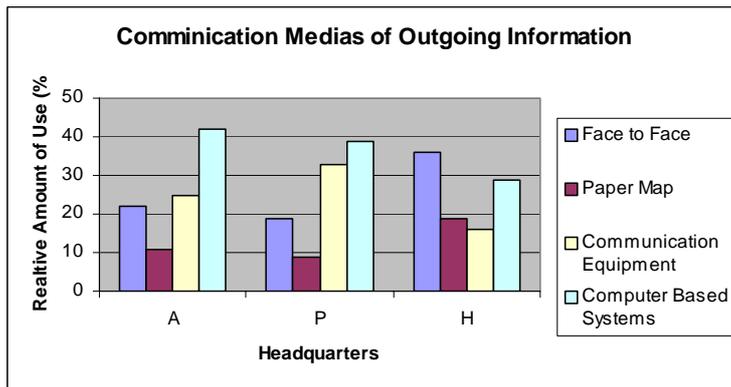


Figure 4. The relative amount of using medias of the released information

Main information flows

Situation officers were asked to specify the three most relevant information sources and information targets. The choices were: Higher echelon, the commander, staff officers, fellow situation officers, subordinate units, and neighbour units and cooperation parties. Results are presented in figures 5 and 6. The total number of nominated information sources was 169, and targets 165. Relative amounts of those were calculated. About one fifth of the information exchange time was used to communicate with the nearest colleagues to refine the image of the situation to be used in other processes outside the situation centre. About half of the time was used to receive and collect information from outside of the headquarters and the rest of time to collect and receive information from the own headquarters. One interesting feature concerning the outgoing information flow of the situation centre at headquarters H was found. There the output flow was directed more to serve the own headquarters than the outer units. The headquarters H had rather compact structure, which allowed people to quickly wander from one working place to another. So, the situation officers could walk to the planning section to release their information, and vice versa the planning officers could easily walk to the situation centre to discuss the situation around the map.

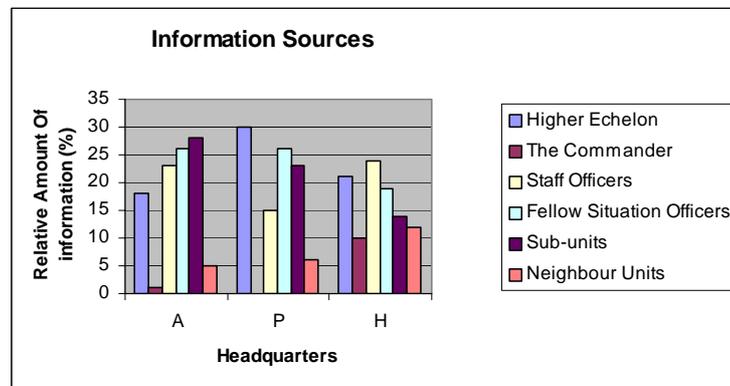


Figure 5. The information sources of the situation officer

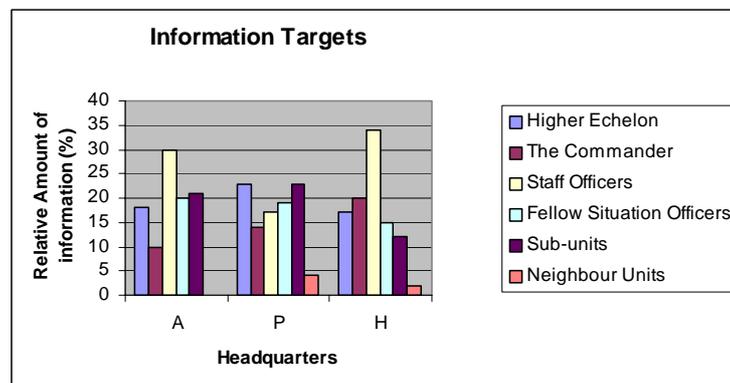


Figure 6. The targets of information distribution of the situation officer

The outgoing information flow differs from the incoming one. The amount of exchanging information with fellow situation officers is obviously equal to the amount of incoming information. This reveals that those officers really discuss among themselves to produce a mutual and combined image of the situation. The output information flow of the situation centre directs more information to the own headquarters than to the outer actors. This reveals that the situational information is used to support the planning and decision-making process of the own headquarters. The situation centre is a vital part in making situational information available to the headquarters to complete the combat planning adequately. The situation centre refines the incoming data into a more abstract form to produce information for the planning process. The advantage of that is that the burden to deal with a vast amount of details is taken away from those who work with the future planning processes.

CONCLUSIONS

The lifeworld contains all that information, which may be available to make interpretations about information that the situation contains. The concept of situation contains information that is necessary to understand, what is going on and may possibly take place. It contains information that is required to put desired action to practice, as well. Situation officers use information of the four categories determined by Habermas. Values form the “fixed” knowledge basis for the interpretation of incoming information. Broadly taken, it can be thought that in the case of a situation officer working in the situation centre, the category called “values” contains all the knowledge and competence of an individual officer. This officer makes judgements and choices on the basis of that knowledge. It directs the information refining process of an individual. Norms are those processes that confine the way of performing one’s work. Tasks and duties determine individual goals, those results that are expected to be gained. All this information affects on the background of an individual situation officer. The information he is dealing with continuously is facts. He is using resources (i.e. own competence and knowledge) and means (communication medias and information combining methods) to create relevant new information to achieve mutually accepted goals. The knowledge basis and competence develops through the whole life.

It was found that the information flow is directed more towards the planning process of one’s own headquarters than to the direction of troops. Figure 7 depicts this conclusion. The relative amount of the use of communication media varied between situation centres. This variation had correlation with targets of distributed information. The more face-to-face interaction and paper maps were used as communication medias, the more information for the headquarters planning process was produced. The planning process still seems to need personal and comprehensive interaction to properly combine the knowledge.

The situation centre is a vital information component of the planning process. About one third of all important information exchange of the situation centre takes place with the planning part of the headquarters. On the other hand, one fifth of relevant information sources and targets of a situation officer are located in the situation centre. Situation officers construct their situational awareness by discussing with each other on the basis of that situational information which is received from the higher echelon, sub-units, neighbours, and inside their own headquarters. Concurrently they take part the planning process by discussing with those officers, who are in charge of that process. They distribute relevant information outside own headquarters, as well. The commander is not a very relevant source of information, but he is rather important user of the information that situation officers produce. The situation centre supports the decision-making at the highest level. 15% of situation officers considered the commander to be one of the three most relevant information targets.

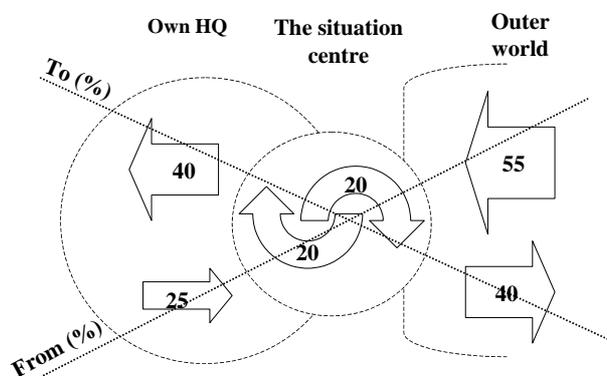


Figure 7. Abstraction of the information flows of the situation officer

Only part of all information that is required to planning and decision-making comes through situation officers. Other sources contain information about environment, resources, means to put action into practice and tasks. Knowledge about the features of the entire system and its possible courses of action in the future are present, as well. It shall be noticed that situation officers gather, combine and release on-line situational information, the planning officers refine and enrich the information and commander makes final decisions on the basis of all that information. Situational information may be delusive or it may be deliberately distractive. Effects of this accidentally or intentionally corrupted situational information are immediate but unpredictable in influence. Incorrect situational information does not necessarily ruin the whole decision-making procedure. Different kind of information refining, combination and judgements are completed during the whole process and minor errors lose their significance. The better is the competence and experience of every officer, the less erroneous situational information effects.

When considering information operations two temporally different viewpoints can be found: Short-term and long-term information operations. Those information operations that will target situational data have short-term effects, but they might cause long-term effects if information attack is directed to strategically meaningful data. If long-term effects are desired the information operations shall be targeted to knowledge. Judgements and decisions are made on the basis of ones knowledge. To gain permanent change to the way of analysing and combining perceived information and making decisions, the knowledge basis shall be reconstructed. Reconstructing the training and educating system will change the thinking. To gain long-term effects, influencing on the implementing of the theories of information and information operations is beneficial. The effect is slow but inevitable. (See Kuusisto and Kuusisto 2003, as well.)

The theory frame used here proved to be valid in this kind of research. The theory used is strong enough to deal with information issues more broadly than it was done here. This opens more opportunities to study information flows and evaluate the effects of information operations on other levels of military organisations, as well as other organisations outside military context.

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