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Situation Officer as a Decisive Enabler
Theoretical Framework to Analyse Information Flows and Action

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Abstract

This paper delves in the world of combat information flow. We are introducing a concept called "situation officer". The task of situation officer is to release commanding and planning officers from the burden of masses of not so necessarily relevant detailed data and information thus leaving more time and thinking space to their main duties. On the other hand, situation officer is releasing necessary information to subunits to fulfil their tasks. We assume that via realizing the concept of situation officer the planning and decision-making cycle will be shortened and directing mutual information resources will be more effective thus giving better opportunities to perform activities more precisely both temporally and spatially. In this paper, we introduce one approach to the theoretical basis of information flowing, and the concept of situation officer.

Keywords: Information management, combat information flow, information superiority

1. Introduction

Shortening the temporal dimension and enforcing the use of available information of decision making to gain advantage from the opponent in dynamically challenging situations is documented to be crucial. (Waltz 1998) This paper introduces one possible solution to gain that advantage in the context of military combination of arms. The concept of situation officer is introduced and studied. The aim of the concept of situation officer is to reduce the communication about, and need to react for present moment issues between higher and lower organisation levels, as well as to direct mutual resources as quickly as possible (see Fig. 1.).

This paper introduces basic theoretical frame of three-phased study. The second part will be empirical phase to study information flows and activities of the situation officer. Finally in the third part some conclusions will be made to determine relevant and realistic tasks for the situation officer and to perform knowledge and know-how of the situation officer.
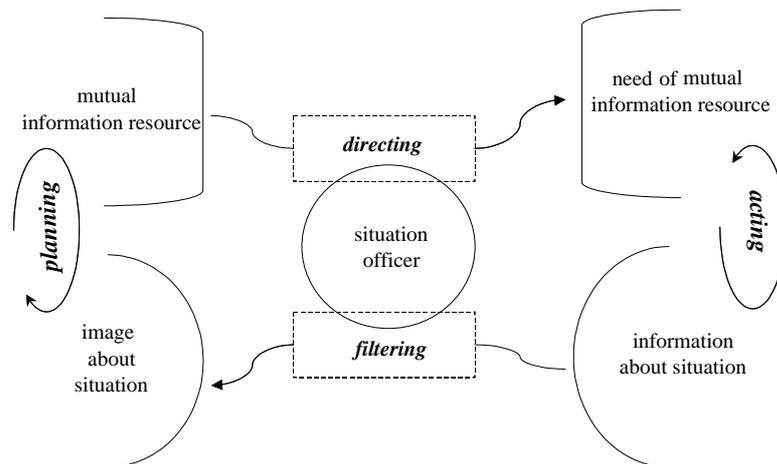

Figure 1. Situation officer is working between planning and acting as a filter of situational information and a director of mutual information resource needed for immediate reaction to reduce the burden of unnecessarily detailed information.

The concept of situation officer produces following advantages:

1. Certain amount of mutual information resources of the higher command level can be directed or redirected faster than if they were in the command of higher level. Part of resource directing task is delegated at the level, where faster communication is possible.
2. Certain amount of detailed information concerning situation will not reach higher level of command thus leaving more time to future planning and concentrate the situation as a whole.
3. Certain amount of minor information resource directing activities will not be a necessity to the higher command level thus leaving time to more precise future planning.
4. The commander is able to guide the whole of the operation without the danger of being forced to involve details.

Raison d'être of this concept is the fact that in time-critical situations information should flow only at, and to the right level. The commander and the planning organisation should not be burdened with too detailed information. Situation officer acts as a "filter", allowing each level concentrate their core tasks. That is the main idea. This study analyses whether this concept is valid and how its validity should be studied. The theoretical framework to study information flows and acts is built around Habermas' theory of communicative action. (Habermas 1984, 1987)

2. The theory of communicative action

2.1 Information

Definitions and classifications of the concept of information are numerous and have varying roots and backgrounds in several scientific disciplines. In this paper, we use Mayer's (2001) categorisation of data, information and knowledge. In ICT-literature data are typically defined to be known facts that can be recorded, e.g., (Elmasri & Navathe 2000). Data are suitable for communication, interpretation, or processing by humans or artificial entities. Information is usually defined as structured data useful for analysis, e.g., (Thierauf 2001). Information has meaning, purpose and relevance, e.g., (Awad & Ghaziri 2003). Knowledge is defined, e.g., as 'the ability to turn information and data into effective action' (Applehans et al. 1999) or as 'a capacity to act' (e.g., Blackler 1995). Mayer (2001) gives a broad definition of knowledge stating that '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'.

Knowledge can be categorised qualitatively, as well. Polanyi (1966) states that qualitative features of information are explicit knowledge and tacit knowledge. Explicit knowledge is determined exposable objective knowledge. Tacit knowledge is subjective and it is based on experiences of an individual. It may be difficult to express in a determined or unambiguous way. (Nonaka – Takeuchi 1995) Tacit knowledge is mainly inner knowledge – it is inside one entity. Instead of that explicit information may be data, information and knowledge, as well. Knowledge creating process enriches data into knowledge during the process, where already existing information is combined with the incoming new information. The result is increased knowledge. Information is transferred mainly as data or information and only very seldom as knowledge. Knowledge is created inside an entity, like Nonaka and Takeuchi prove in their production. This process takes time. The process sets demands to information transferring process, as well. It cannot be assumed that mutual understanding through mutual knowledge will occur immediately. Explicit knowledge can be articulated or expressed but tacit knowledge is difficult to describe. Tacit knowledge is often based on experience (Polanyi 1966). Rather than regarding knowledge as something that people have, it is widely understood that knowing is better regarded as something that people do (Blackler 1995).

Let us consider this question by help of Antonio Damasio's (1999) thoughts about how human mind works, when processing information. According to his thinking the knowledge is being constructed during the process of interaction between a conscious human being and the outer world. Knowledge creating process inside a human being is continuous interaction between perceptions and memories. Knowledge is created by combining perceptions to remembered information. An essentiality is that observations about outer world are understood. Understanding depends on the knowledge that already exists. A human being interprets observations via a mental filter, which consists of those pre-assumptions, which have been formatted in the mind during the whole life (Merleau-Ponty 1968). Figure 2 describes this process.

Knowledge creating process is a process of understanding. Perceived events will be connected to those, which are situated in memory; new information is created and it is situated back in the memory. Via this process perceived data refines into knowledge overtime. In both ones explicitly perceived data come s into the system and finally produces tacit knowledge. Incoming data and information will refine to information and knowledge during time in the thinking process. This process is depicted in figure 3. There, two entities are interacting with each other and building up new knowledge via internal and external information flow. Ronald Maier (2002) describes this process, as well. He states that only data can be transported or communicated. Data may be interpreted by individuals or social systems (Maier 2002, 61). This statement could be interpreted as truthful. However, communication at the level of knowledge may be completed, if mutual history of communicating entities is near by each other. Then, with a very small amount of data, mutual understanding will occur, and it could be stated that mutual knowledge is used to interpret the situation.
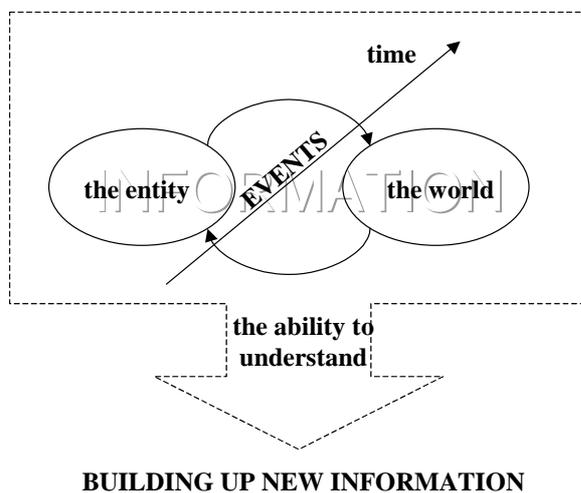

Figure 2. In-human knowledge-creation process. (Applied from the basis of Damasio 1999).
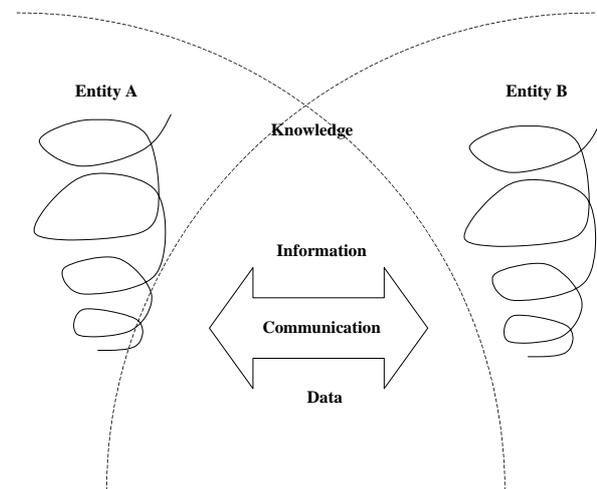
Figure 3. An abstraction about information refining process.

2.2 The framework of activity

The concept of communication presumes that information, which is transferred between those, who communicate, will reach the receiving party and will be understood. If communication is bound in purposeful action, the information shall be used to cause something, as well. Communicative act produces available information to other processes. Communicative act is discussed in the context of objective, subjective, social and lifeworld. Those concepts are dealt with the viewpoint of information.

From the viewpoint of information, the subjective world is a knowledge construction of one nominated entity. Objective world contains the potential of all information (Figure 4). Social

world contains those mutual norms and rules, which will direct interaction with each other. According to Habermas, 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 (Habermas 1989, 124).
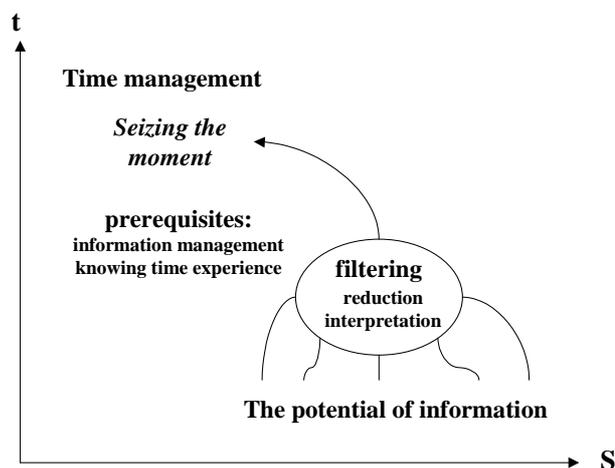
Figure 4. The information potential of the objective world (Kuusisto & Helokunnas 2003)

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. 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 communication meet the requirements of mutually understandable real world consisting of subjective, objective and social sub-worlds. (Habermas 1989, 126)

Actions taken are interpreted against that. Maurice Merlau-Ponty (1968) writes about fields via which the observations of outer world are interpreted. This makes the perception process somewhat personal and dependant on individuals mental filters, which are formed during the whole life. Those mental filters look very much like the concept of lifeworld, but dealing with incoming information of only one individual. The concept of lifeworld will take account on all information flows, whether they are coming in or going out of the subject. It takes account the social environs, as well. From the perspective of participant of an interactive action, "lifeworld will appear as a horizon forming context of processes of reaching understanding." (Habermas 1989, 135) Lifeworld is the overall subjective frame of knowledge, against which the interpretation of incoming and the filtering of outgoing information is made. So, lifeworld can be considered as a structure of mutual knowledge. 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. It can be considered that all information transferring activities will happen in the lifeworld. Figure 5. will enlighten the relations of the sub-worlds discussed here.
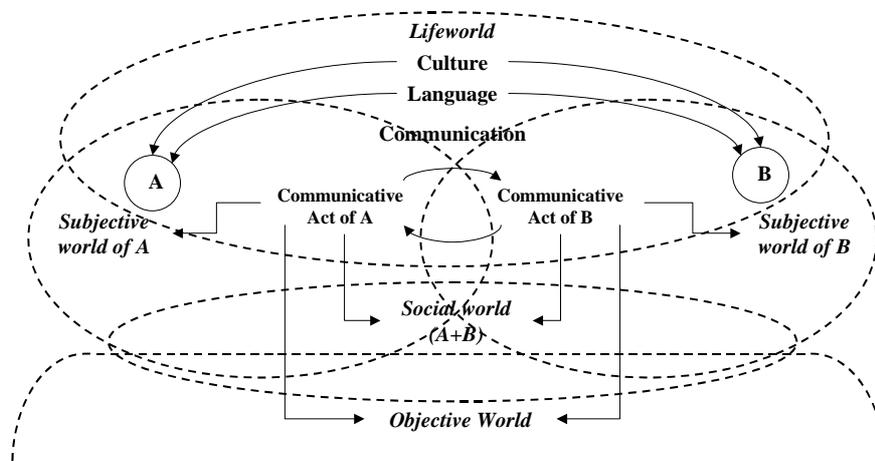
Figure 5. Sub-world relations in communicative acts. (Habermas 1989, 127, figure 20) Transferred information will effect on the whole system.

"A situation is a segment of lifeworld contexts of relevance." The situation represents a part of the lifeworld delimited by interests and aims of at least one participant. The concept of situation assumes that someone of interacting entities has aims, which can be realised as relevant through the interpretation of the situation. Situation is expressed via goals and plans of action in a context of something, which is understandably relevant. This context is determined and ordered concentrically and thus the longer the spatiotemporal or social distance is, the more difficult the situations are to understand. (Habermas 1989, 122 - 127)
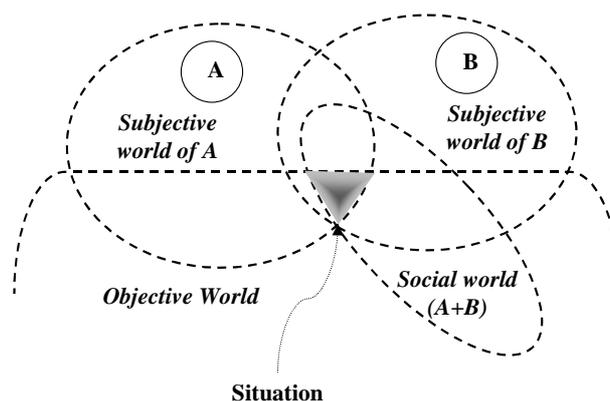
Figure 6. The concept of situation.

From the information's viewpoint, the lifeworld is a structure of knowledge, via which the information potential of the world will be outlined. 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. Lifeworld confines the possibilities to use the information potential, which is present spatial-temporally in both the

subjective and the objective world. Situation confines the use of this information in the system of subjective worlds, objective world and social world.

Some consequences can be found from the basis of the concepts of lifeworld and situation. The lifeworld confines the limits of information availability. It sets the boundaries within understanding and use of information can be realised. The meaning of situation depends on the viewpoint. From the viewpoint of the actor, which is setting the goals, situation confines the determined availability of both incoming and outgoing information. Goal setting and planning are realised by only the information that is available. This actor produces information via mutual lifeworld to the outer world containing objective, other subjective and social sub-worlds. The availability of this information is bound again to both mutual lifeworld and receiving parties subjective worlds.

It seems rather obvious that part of information availability is missed during the process mentioned above. The further away the mutual basis is from one subject to another, the more the availability of the information decreases. 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. So, if an actor does not understand the incoming information, the results are poor.

3. The concept of situation officer

3.1 The information environment of the situation officer

The tempo on the battlefield has increased. That is obvious. But what does it mean? In our approach it means increasing demands to think about those consequences, which the information management of planning and decision-making will face. Previously decision-making and authorization to make conclusions about incoming information were concentrated to commanding officers. That was possible, because the tempo of change was not too fierce not to be dealt with one skillful and competent person. When the battle space has broadened and dynamism increased at the same time, it is rather painful to be aware of all relevant events of the working environment on time. This leads to that inevitability that our own activities will occur reactively. Further on, this may lead to the annoying situation to be defeated. So, the information gathering, refining and distribution system should be constructed in such a way that every officer will be able to concentrate to such spatial-temporal-informational environment, which he/she can deal with.

The simplest structure, where situation officer will act is monolithic "pipeline", where in the other end is the officer in charge and in the other end information sources outside the headquarters. The simplest activity for the situation officer in this structure is to relay information from outside the headquarters to officer in charge and vice versa. Situation officer acts as a sort of buffer and transmitter without any authority to make any information refining. This will work if situation is calm and the total amount of information remains at moderate level. In that kind of situation the officer in charge can combine and refine all possible information

(originated from outside his own task, as well), which may have effects on his branch. Anyhow, it would be rather optimistic thinking if we imagine that pace of activities in the battlefield will remain at moderate level. It could be concluded without feeling scientifically very anguished that officers in charge are not able to deal with all available detailed information precisely and promptly. So, it seems that some kind of information management activities are needed to guarantee the freedom to act to officers in charge. Here, the concept of situation officer as an information manager will step in.
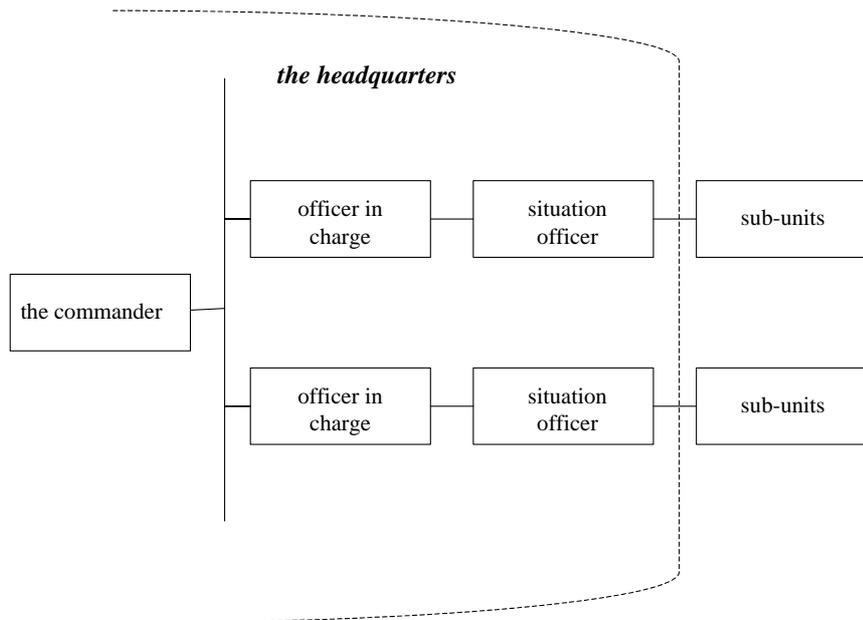

Figure 7. Situation officers placed in the information pipeline.

Figure 8 presents the number of interfaces of one situation officer. The sheer number of interfaces may seem paralyzing. Situation officer has to manage some 30 to nearly 70 interfaces simultaneously. Even though technologically adequate command and control system is available, requirements to manage this wholeness of information interfaces will remain. Will this be possible? We state that it is. In this paper we map some ideas to manage this kind of complex knowledge administration system.

One of the main problems of this kind of complex system is to determine authorities of making decisions, conducting conclusions and distributing information. In this research, the focal point is set to information refining process. Practically this means answering to three questions; who has the right to refine incoming data as information and knowledge, and when and to whom these results will be distributed. Here, we will make an effort to conduct ground for constructing a hypothesis to determine information management authorities in headquarters.
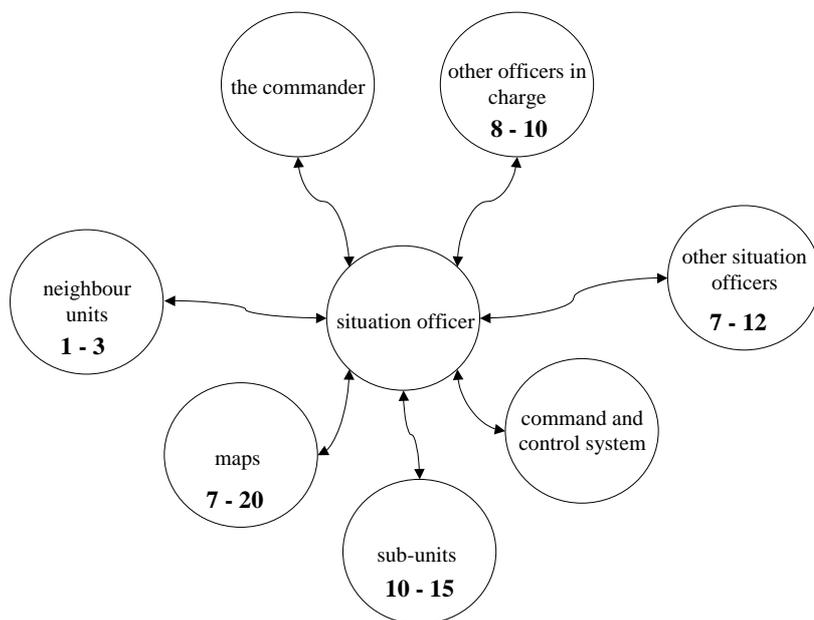
Figure 8. Information interfaces of the situation officer.

3.2 Challenges and ideas

The basic challenge is, how to manage the whole combination of arms during fierce situation, where dynamics is high and information has high risk to be outdated before reaching authorized decision-maker. One possibility to manage this apparent chaos is to be present at the "hotspot", the focal point of activity. This gives a splendid opportunity to make relevant decisions at that situation at that moment from the basis of personal perceptions. This will support to get overall image about local feelings about situation. But this does not support to gain overall image of the wholeness of the situation. And what happens, if several critical events will appear at the same time? When dynamism both in spatial and information dimensions is high, it will be most relevant to have an opportunity to concentrate only to those events and information, which will be relevant for concentrating to core business at each level. The commander and other officers in charge shall be released from the burden of receiving such irrelevant information, which does not serve their core duties. To gain that objective, we have preliminary hypothesis of developing the concept of situation officer.

The first proposal: We propose that the situation officer shall have limited authority to perform the directing of resources (both information and physical) during the action. This will resemble the course of action of the air traffic controller. This doesn't mean that the commander or any other officer in charge will give up his status as a decision-maker. On the contrary, it means that he is able to concentrate to the wholeness of situation at the right ontological (both spatially and temporally) level.

The second proposal: The situation officer will guide activity of nominated subordinate units according to the plans and orders of the commander and the chief of operations. In that way the commander and chief of operations can concentrate more clearly to plan and direct the wholeness of activity instead of being forced to take stand on smaller scale events. Commanders will be released to think about future possibilities and restrictions, as well as the whole picture of the operation, while situation officers will deal with those events, which will require very fast reactions at short term at the level of combined arms.

The third proposal: The situation officer shall have authorization to refine incoming data and information to offer as optimal information flow as possible both in quantity and quality to each level. When arranged adequately, this process will reduce to total amount of transferred data and information. Mainly such data and information, which will be helpful for knowledge creation process locally, will be transferred.

The operating concept of situation officer will release the operation planning function and the operation management function to concentrate to their core business, which presumably will look spatially-temporally at objectives. We assume that this new kind of concept of situation officer will improve the management of temporal dimension by the next four activities:

1. More precise information and knowledge will be reached.
2. The overall knowledge management process will be enhanced.
3. Larger and more detailed time-space will be manageable.
4. Quicker decisions without losing certainty will be made.

First two items will perform better quality of information. Situation officer will operate as the filtering and distributing function in the formation flow (compare figure 4.). These functions assure that relevant actors of the organization will have precise information for planning, decision-making and directing of resources. Third item will enhance situational awareness by allowing relevant information to be gathered from larger space and distributed to the right users at the right level of the information hierarchy. The raw data is not necessarily distributed but conclusions made from the basis of it. This all will lead to ability to carry out more relevant decisions quicker. Figure 9 will depict this thinking. When the responsibility of the situation officer for filtering and refining of information is increased the commander with his closest officers in charge can concentrate to wider space and further in the future on the temporal axis.
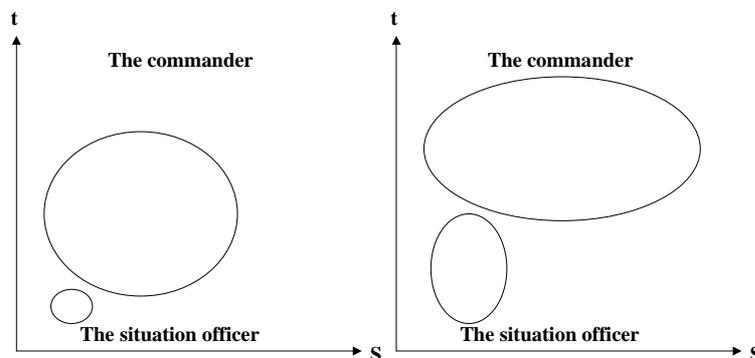

Figure 9. The situation officer authorized as a knowledge manager releases the battle planners to concentrate into the future in a wider space.

4. Conclusions

Considering Habermas' theory of communicative act from the viewpoint of information flowing the objective world contains the potential of all information, social world determines the rules of managing information and lifeworld is the overall mutual knowledge base. 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. When referring to Figure 5, it can be noticed that information transferring takes place in lifeworld via communication, and it is confined by culture and language. This communicative act has effects on social and objective world. The understanding about the potential of information will change, and the rules determining information management will evolve. It can be concluded that the more mutually known the lifeworld is, the less information must be transferred to gain mutual understanding about the situation.

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 and already existing. Existing information contains both military competence and lessons learned about previous situations. This is most relevant to form a coherent basis of mutual knowledge of all actors in the same lifeworld. 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.

In our concept, the situation officer acts like a "perception manager". He has a somewhat responsible task. Military competence requirements for the situation officer seem to be rather high. Anyhow, the tactical advantage could be notable. By managing information, the opportunity to take both space and time into own possession will occur more probably.

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