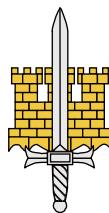


SHIFT
Shared Information Framework
and Technology
Concept
ver 0.9

February 2009

Edited by
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Finnish Defence University
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Final MNE 5 product

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Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 01 FEB 2009		2. REPORT TYPE Summary		3. DATES COVERED -	
4. TITLE AND SUBTITLE SHIFT - Shared Information Framework and Technology Concept				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S) Sami Vesterinen				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Finnish Defence University, Department of Military Technology, Helsinki, FI				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) USJFCOM J9 Joint Concept Development and Experimentation, Suffolk, VA				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES The original document contains color images.					
14. ABSTRACT Shared Information Framework and Technology (SHIFT) was originally created for MNE 5 covering the aspects of information sharing as a concept and its supporting tools within a comprehensive approach framework. SHIFT is used in MNE 5 to experiment with information flows amongst all participating actors in the field, of which potential users might include individuals from governmental entities, non-governmental organizations, military, private, local and other actors. SHIFT is an effort to enhance collaboration between governmental, non-governmental, private and local actors in the conflict regions and to produce better situational picture. SHIFT is not a competitor of any individual effort to gain better situational awareness among organizations, but the aim is to develop it in accordance with other initiatives of information sharing and collaboration. SHIFT is both a concept and a practical solution.					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 48	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

FOREWORD

Today's complex situations in the crisis areas require coordinated participation of nations and various agencies to develop integrated planning, execution and assessment capabilities. Multinational Experiment 5 (MNE 5) is an effort to study, explore and experiment new approaches to crisis prevention and consequent crisis management activities. It is an effort to combine all the relevant governmental organizations and a comprehensive approach to crisis prevention and crisis management. The core partner nations and participants in the experiment are Australia, Austria, Canada, Denmark, Finland, France, Germany, Spain, Sweden, the United Kingdom, the United States, NATO/ACT and civilian partners.

Shared Information Framework and Technology (SHIFT) was originally created for Multinational Experimentation 5 -program covering the aspects of information sharing as a concept and its supporting tools within a comprehensive approach framework. SHIFT is used in MNE5 to experiment with information flows amongst all participating actors in the field, of which potential SHIFT users might include for example individuals from governmental entities, non-governmental organizations, military, private, local and other actors.

SHIFT is an effort to enhance collaboration between governmental, non-governmental, private and local actors in the conflict regions and to produce better "situational picture". SHIFT is not a competitor of any individual effort to gain better situational awareness among organizations, but the aim is to develop it in accordance with other initiatives of information sharing and collaboration. SHIFT is both a concept and a practical solution.

Are there already too many competing initiatives that serve somewhat similar purposes? This "problem" could be overcome when using SHIFT becomes essential or at least highly relevant for each actor and their work, including the work done by their organizations. There should be continuous research on potential applications and comparison of best practices – and implementing into SHIFT those that are seen as beneficial. This will furthermore help that the technical innovations within SHIFT will not stay abreast with technology advances elsewhere. SHIFT is not an isolated system in the world but SHIFT is based on open interfaces which allow easy technical integration with other systems.

As a concept, it describes possibilities to co-operate between separate entities and chains of command using a trusted information sharing environment. A common interest in safety, a desire to avoid conflict and to make the resources better utilized could make the environment attractive enough for the most relevant actors in the field. SHIFT encourages exploring and – if necessary – refining the existing information sharing policies that may prohibit sharing, even when it is essential in order to achieve the desired effects or to avoid accidents or losses. SHIFT is there to enable networking among the actors and organizations of crisis management.

SHIFT Shared Information Framework and Technology

This concept is originally created by a multinational pool of experts and professionals from organizations involved in crisis prevention or management areas, both governmental and non-governmental organizations. Some key contributors to the concept include governmental representatives from Ministries of Defence, Foreign Affairs, Interior and Transport and Communications of Finland. The non-governmental point of view and expertise was brought by several organizations involved in crisis management field such as Crisis Management Initiative, Safer Access, Plan, Save the Children and the Finnish Refugee Council. Several other organizations, such as EU and NATO, contributed with their inputs. Many background studies have been done by researchers in different Universities such as the Helsinki University of Technology and the Turku School of Economics. The editorial team would like to thank all the contributors for their valuable work.

This concept has been created in various multinational workshops and seminars during the period of 2006-2008. Some elements have already been studied and tested in Multinational Experiment 5 events and the key findings and lessons identified are being implemented into the concept and its tools. It is highly encouraged to take a look at the other relevant documents that further explain the SHIFT background, its tools and how they are supposed to be used. The other relevant documents are: “SHIFT Theoretically-Practically Motivated Framework” and the “SHIFT Handbook”

This concept paper and the technical tool demonstrate one approach to information sharing in the crises management. The concept itself is regarded as a shareware that can be implemented for other uses as well. The technical demonstrator is currently owned by IBM Finland. The concept does not force to use the here demonstrated IBM tool, though there is a great linkage between those. It has to be noted though, that this concept and its supporting tools are constantly under development and therefore we encourage the users always to look after the latest versions.

Real world experience and research shows that those inter-agency IM systems that do function to some degree can be described as being highly fragmented and far from comprehensive. This reality may be the opening SHIFT requires to differentiate itself from existing IM initiatives described above and provide value added. It is required when implemented that SHIFT’s institutional mandate, respective roles of its functionalities and who they serve, needs a clear definition. This could be understood also as that a mandate is needed.

SHIFT as a concept is potentially capable of global reach and is scalable to large and small, local and global contexts. This concept has been created with an aim to create something useable for the crisis management field and for the efforts to make the world a safer place.

For the team,

In Helsinki, February 2009

Sami Vesterinen

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Shared Information Framework and Technology - SHIFT

1. Introduction

1.1. Purpose of the concept

This concept suggests an approach to improve information sharing among crisis prevention and response communities supported by collaborative tools and services. The aim of SHIFT (Shared Information Framework and Technology) is to promote the use of a common and neutral information sharing platform rather than bilateral information exchange arrangements. The general goal is to create a safer environment and to avoid duplicating and conflicting efforts in the field.

SHIFT is operated by a neutral organization (later SHIFToTorg), but was initially launched as a Finnish government contribution to Multinational Experimentation (MNE 5, 2006 – 2009). Primary SHIFT users are individuals from governmental entities, non governmental organizations, military, private, local and other actors in the field. As global information sharing environment SHIFT can be used by anybody who is interested to contribute to the crisis response.

1.2. Background

In this chapter the following three phenomena are explained to motivate the proposed SHIFT approach. Current organizational structures and technological usage do not meet the requirements of today's complex crisis management environment.

1.2.1. Complexity of crisis management

Over the past 15 years, the number and scope of international crisis management operations have increased dramatically. In response to the changing nature and increased complexity of contemporary conflicts, crisis management operations have evolved from traditional peacekeeping to include peace enforcement and large-scale civilian operations. Today the crisis management community consists of various entities and groups, referred as "actors" throughout this document with divergent missions, resources and agendas.

Barriers between both private and public, and civilian and military institutions represent a major challenge in the international crisis management community. This leads to both insufficient and inefficient action with many groups and organizations working at cross purposes. Transforming lessons learned and best practices into institutional knowledge represents one of the greatest challenges for the international crisis management community today. Currently, few agreements exist concerning how interagency information sharing should be organized in the crisis management context.

Areas affected by crisis often lack a robust communication infrastructure. Usually both governmental and non-governmental actors, particularly those at the local level, can have limited access to information and communication systems. Typically, the planning and development of communication systems take place within each individual organization. The solutions may meet the respective organization's requirements, but they lack the interface to the systems of other relevant actors in the field. Such a patchwork of separate systems neither improves information sharing nor guarantees the safety and security of communities and personnel in crisis environments.

1.2.2. From organizational structures to social networks

Crisis management activities in a conflict region span over a host of different actors. Their activities both exploit and create information that is supplied for and acquired by them. Often the information needed for the execution of the activities, especially for the management and decision making, does not meet the requirements. To enable effective action, information should flow smoothly, both internally within an organization and collaboratively between organizations. To succeed, the actors must have situational awareness and understanding. This can be achieved by using advanced technological systems combined with human analysis.

Crisis management involves activities performed on several organizational levels. Information is delivered and retrieved on each level and between them. The main levels include the policy level that guides the operational level which again reports back to the policy level. However, as crisis management activities are implemented and managed by a variety of actors, there is not any one policy level actor that can manage all actors on the operational level by implementing a classic command and control approach. Instead, the operational level activities are self-synchronizing. This aims at an optimal use of resources in the specific context. One of the prerequisites for a successful self-synchronization is high quality information and shared situational awareness. This means shared understanding in the crisis management community of the situation, capabilities and plausible futures.

Typically, the organizational structure of actors in crisis management is not designed for collaboration and smooth information sharing. Instead, organizations are often structured to reflect their own particular vision, mission and activities. The necessity of appropriate situational awareness and information management in today's international crisis management thus poses challenges also to the organizational structure of the actors.

1.2.3. Technological capabilities are not adequately used

In most cases, even in the situations where information sharing has been most effective, the connections have been based on conventional tools such as face-to-face meetings, the telephone, SMS and e-mail. The latest information technology, such as internet -based interactive tools, provide useful solutions that could enhance the information sharing significantly among the international crisis management actors with relatively modest additional resources. However, the actors may still have very limited understanding how to use these systems efficiently. Available systems are many but they seldom provide comprehensive solutions for the users.

Current way to create, store and distribute information does not support the needs to find and utilize the information. Documents are often stored to individual hard drives instead of accessible databases.

1.3. Current approaches

1.3.1. Previous research and lessons identified

The following chapter is based on research of various academic publications and papers published by academic forums or by different crisis management organizations including EU and UN. The lessons learned are results from observations of different MNE5 experiment events and practical experiences from the field.

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It has been widely recognized by various crisis management actors, that there is a real and acute need to develop better information gathering and dissemination systems. Research and experience have proven that availability of situational information, competence, actors' features, future developments and decisions is important for all the active actors involved in the crisis management. On the other hand there is a considerable imbalance between the information that is required and the information that is available to each actor. One reason for this imbalance is that the actors are not willing to share certain types of information although they would like to receive the same type of information from others.

There are several reasons why the various actors restrict the amount and quality of information they are willing to share. Restrictions may be based on cultural aspects, organizations' aims and goals, organizations' working principles and information security concerns.

The most important factor for willingness to share information is trust. Creating trust requires mutual understanding and acceptance developed over time. Lessons from experiences in the field emphasize that the process to create trust required for effective information sharing is slow.

Various actors have different needs, capacity and methodology for analyzing the information they receive. This may lead to differing conclusions, even when based on the same data and information. In addition the different actors will interpret the information from their own perspective. Security is a good example of one field where often there is both a need and lack of shared analysis. In many organizations, security may not be the expertise of the people working in the field, or security and safety issues may be subordinated other functions. So, there is a need for common information analysis, preferably in the form of recommendations.

It is believed by scientists working on organizational issues that flexibility in changing organizational structures may give substantial improvements in effectiveness. In practical situations, actors tend to focus on their own organization and follow the established action patterns. The willingness to organize to any ad hoc organization, to form task based organizations, or to self-organize is thus limited and time consuming.

The credibility of an information service provider is critical. The organization providing such a service must be transparent and operate outside any other party involved in the management of the crisis. This has also to be kept in mind when recruiting people to run such services.

Well-functioning information sharing procedures are difficult to be developed during operations in the field. Ideally, they should, at least to some degree, be in place before any large scale operations in a conflict region starts.

1.3.2. Some existing initiatives

A number of initiatives have been created to address the issue of information sharing and collaboration in crisis. The very urgency of the problem has caused many of these initiatives to be created in an ad hoc and uncoordinated manner. The nature of these initiatives, while not necessarily representing an efficient or joint response, do provide a wide view of possible approaches and methods.

One example is the **Safety Information Reporting Service (SIRS)**, a concept developed by a consortium of humanitarian response organizations under the Crisis Management Initiative's (CMI) ITCM project (Information Technology and Crisis Management). The purpose of SIRS is to become an information management service that provides safety and security information services for local NGO security collaborations. The SIRS has yet to deploy a prototype platform, but has largely contributed to the body of thought regarding collaboration on security information amongst the relief and development community.

The NATO ACT Civil-Military Overview (CMO) is an experimental portal supported by a dedicated Information and Knowledge Management organization, the Civil-military Fusion Centre (CFC). Both are part of a development effort conducted by NATO Allied Command Transformation in consultation with various civil organizations. It is designed to improve interaction between civil and military actors. The CMO would provide tools to allow users to share information through wikis, blogs, etc. while the CFC would be a central point of contact for users to send requests for information.

InSTEDD is a non-profit organization that aims to help communities around the world by using Web and communications technology to identify and warn others of outbreaks like Avian flu or disasters like Hurricane Katrina. It is a project of google.org, the charitable arm of Google. InSTEDD has produced a number of technological innovations which are intended to improve communications, and all of which are freely available on the web.

HarmonieWeb is a web-based project designed to facilitate the exchange of information across the civil-government boundary, and is "associated with Stability, Security, Transition and Reconstruction Operations or Humanitarian Assistance and Disaster relief." It is operated by US Joint Forces Command, although this is not stated in the public area of the website. It appears to still be in an experimental stage.

SAHANA is a web based collaboration toolset, built as a free and open source platform. It was built in response to the 2004 Tsunami. The component parts of SAHANA are independently employable, and the open platform allows for additional tools to be developed as needed. After three years of development, the SAHANA toolset continues to be developed and improved.

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The UN Office for the Co-ordination of Humanitarian Affairs (OCHA) has developed several initiatives in the field of information sharing. **ReliefWeb** is an on-line gateway to information (documents and maps) on humanitarian emergencies and disasters. Humanitarian Information Centers (HIC) exist in a number of regions to support the co-ordination of humanitarian assistance through the provision of information products and services. Another information management system operated by OCHA is the “**Virtual OSOCC**”, which is used to exchange information before, during and after an emergency. It is regarded as imperative for coordinating the international humanitarian response in the first 1-2 weeks of an emergency.

Within the NGO community, there have been various initiatives in different locations to address the problem, such as the Afghanistan NGO Safety Office (ANSO), NGO Coordinating Committee in Iraq (NCCI), NGO Security Preparedness and Support Project (NGO-SPAS) in Somalia and the now defunct Baluchistan NGO Security Office (BINGO) in Pakistan. ANSO has often been considered as the “state of the art” in this field, but, at the same time, insufficient. ANSO was built to address an overwhelming need for better information sharing, but it has been criticized for not always having the right human resources, the right IT and communications, or appropriate vehicles to do its job properly. However, ANSO has proved to be successful as it was the first initiative of its kind, and it was able to bring together different kinds of actors in a trusted environment. ANSO was also able to have an authoritative voice in the security debate and on the causes of insecurity. In some other conflict regions, for example in Sudan, there have been problems in launching an information sharing service due to interference by powerful local actors. Similar concerns sparked the closure of BINGO by the Pakistani government.

Overall, the general trend in incident management and information-sharing systems, where they do exist, show that they are clearly in demand. At the same time, it also seems clear that the existing ad hoc arrangements are not as effective as they need to be.

1.3.3. Differentiating the approaches

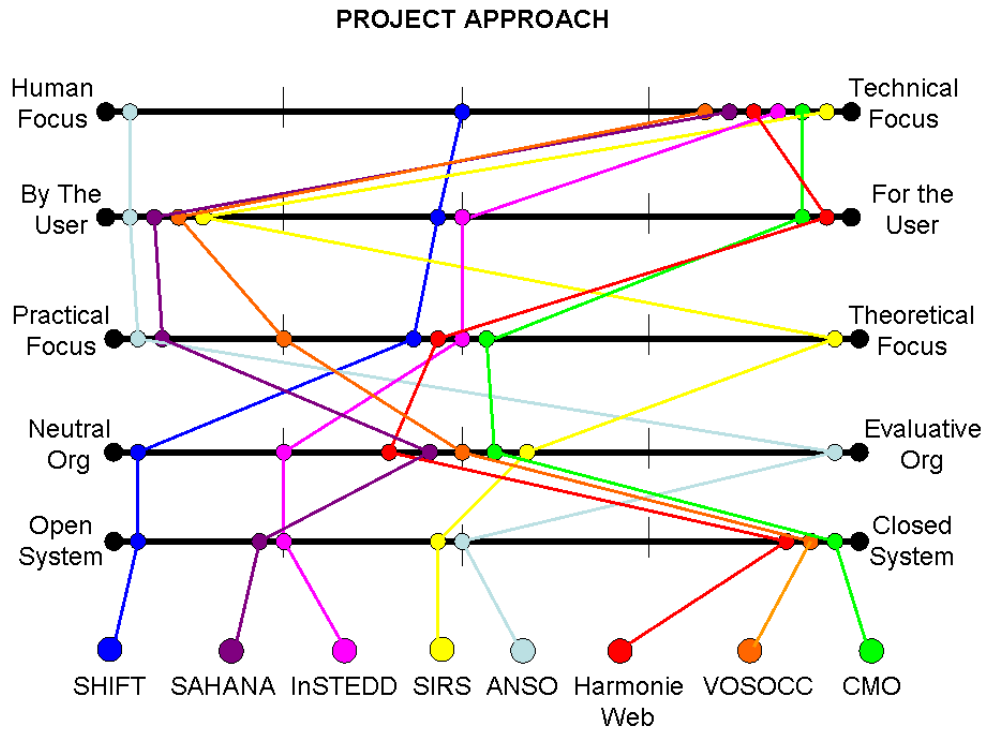


Figure 1. Examples of Information Sharing Solutions.

A general illustration of existing projects and their approach. (Please note that this picture does not represent the official view of the individual projects and therefore should only be seen as an example how they differ from each other)

All of the projects above take different approaches to essentially the same problem. Differentiating between the projects and their approaches allows for a clearer understanding of the field of solutions that currently exist.

The first descriptive dichotomy is that of a human versus technical focus. Most initiatives are clustered around a technical focus, finding technological solutions to the issue of collaboration. Only ANSO and the SHIFT break this pattern, with greater focus on human to human contact regardless of the interface.

The second dichotomy describes whether the system was designed and implemented by the users or for the users by a single outside party. HarmonieWeb, created by JFCOM as a platform for intra-agency collaboration, is an example of a solution generated for the users. SAHANA is an example of a grassroots application which was created by the users themselves.

The third dichotomy describes whether the initiative is primarily a practical or theoretical/academic one. ANSO is an example of a practical initiative which focused on immediate implementation of functioning system. SIRS is an example of the opposite, which (intentionally or otherwise) produced research and discussion on needs and best practice, but never resulted in an implementation in the field.

The fourth dichotomy describes the role of the organization in regards to the information handled through its system. The SHIFT proposes to maintain a neutral sharing environment, where the SHIFToorg does not vet or analyze the information that it contains. ANSO, while claiming neutrality, is an example of an organization that does rate information for accuracy, and also provides analysis.

The fifth dichotomy describes whether the system is open or closed. The intention of SHIFT is to maintain an open system that is accessible for viewing by the general public through search engines such as Google. Other systems are closed to the public, for use by a particular community – such as the Virtual OSOCC. Most systems occupy the middle ground between these extremes, giving general access to users after some form of vetting process.

1.3.4. Reasons for new approach

International crisis management, with its comprehensive multinational civil-military/civil-civil – or interagency - approach, is still a relatively recent practice. It has already become evident, through both practical experience and conceptual studies, that it can be improved in many aspects.

Having sufficient information describing conflict situations has been identified as one essential prerequisite for successful crisis management. There is a need both for information on the operating area, as well as on plans, strategies and character of the various involved actors.

In real life information sharing with other organizations has been limited, bilateral, through ad hoc, not institutionalized arrangements, based typically on personal relationships and trust. As a result, the information has often been unsystematically gathered, has often been insufficient to meet needs, and in some cases has even led to unnecessary risk-taking and overlapping or counterproductive actions.

SHIFT differs from most of the earlier initiatives because of its emphasis on a neutral and open environment, both of which are critical to ensuring widespread adoption of the system. Without widespread use, potential collaboration becomes limited to a small sub-set of the actual community. Coupled with a focus on implementing a workable system in the field and ongoing consultation with users, SHIFT has adopted much of the best development practice from earlier initiatives and is pioneering the open/neutral concept as a means to increase the chances of generating successful collaboration.

2. SHIFT Philosophy

2.1. SHIFT - the definition

SHIFT (Shared Information Framework and Technology) is both a concept and a practical solution. As a concept, it describes possibilities to co-operate between separate entities and lines of communication using a trusted/neutral information sharing environment. As a practical solution SHIFT seeks to replace the current practice of building bilateral information exchange connections and relationships between and among governmental, non-governmental, private and local actors in their regions of interest with a formal socialized network technology. SHIFT is thus both an information source and a potential means to disseminate, share and store information. SHIFT encourages exploring and, if necessary, redefining the existing information sharing policies that may prohibit sharing. SHIFT can also be understood to support a cultural shift towards more transparent and open information sharing settings supported by current technological capabilities.

SHIFT consists of three main elements. First, it focuses on information sharing among all relevant crisis management actors and decision making in crisis management operations in the field.

Second, SHIFT is a framework based on information theory, lessons learned and best practices in situational awareness. Framework is defined by the cultural considerations, information sharing policies, organizations, processes, networks and models of information flows.

Third, SHIFT presents state-of-the-art technological solutions: architecture, information management, administration, services and tools that will be developed iteratively along with the progress of the framework. The aim is to implement a new methodology and technological features for testing, training and experimentation purposes. Technology development is driven by Service Oriented Architecture (SOA) and Commercial-Off-The-Shelf (COTS) principles.

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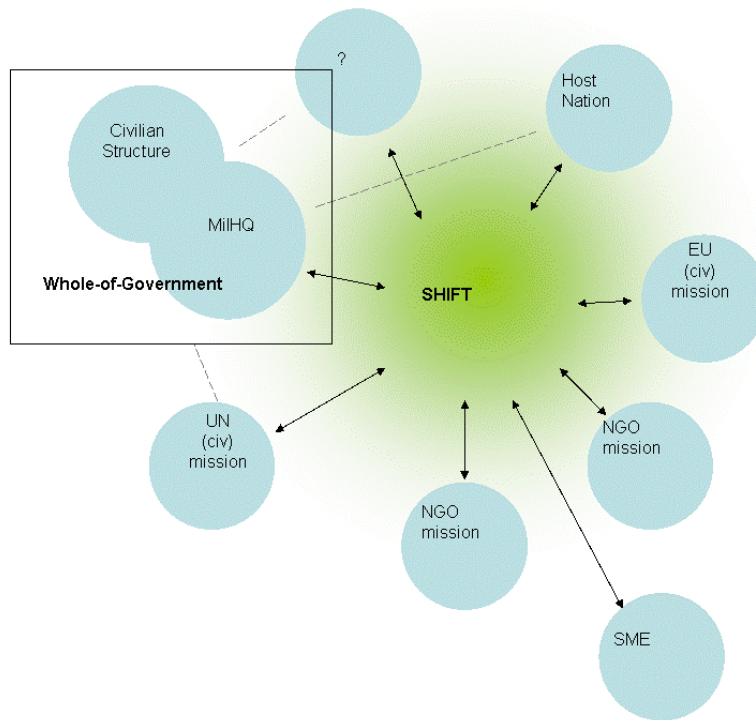


Figure 2: SHIFT positioned among the actors

2.2. Hypothesis

Information sharing on a bilateral basis is inefficient particularly in regions characterized by a great number of actors. Instead, a new, more efficient information sharing environment (such as SHIFT) should be introduced.

The SHIFT philosophy stems from the adoption of existing best practices in information sharing and the hypothesis: If a SHIFT-type common information sharing environment is in use, then a safer operating environment and less duplication and conflicts of efforts can be achieved

2.3. SHIFT Tenets

The SHIFT philosophy has three main tenets, which jointly define the project's approach.

2.3.1. SHIFT promotes information sharing

SHIFT is structured to best enable both vertical and lateral information sharing among diverse groups. The free flow of knowledge is sought by encouraging users to “open source” as much information as possible, avoid the over-classification of material and relax intellectual property restrictions. While most of the content published within the SHIFT will be attributable to defined users (as a further incentive to collaboration by making communities of interest easier to be recognized or defined), there must also be a possibility of anonymous publishing. This allows for sensitive information to be authored by individuals without the fear of retaliation, and ensures that a positive sharing environment is maintained.

2.3.2. SHIFT is user driven

Working processes and the information posted in SHIFT is supposed to evolve from the activity of the user. SHIFT will to the greatest extent possible give flexibility for the user to adjust his/hers SHIFT interface to fit the users needs and habits. Except for some basic rules of good conduct, SHIFT will not impose many business rules on the users. Sensible business rules are believed to emerge during the use of SHIFT, although guidelines from previous tests with SHIFT will be offered to the users.

Information in SHIFT will normally be regarded as open source. Often some individual documents in SHIFT will not be “owned” by SHIFT or a user in the traditional sense. Instead the content will develop in a collaborative and, most likely, an incremental manner. In this way the content of the documents are likely to grow and become more refined over time. On the other hand, actors can publish their information that is owned by them as “their intellectual property rights” like an official document of an organization or a research paper published by its' author. While sharing the information it could still be protected as their property with a statement. This right should be accepted by all the actors.

A fundamental principle for the organization managing SHIFT is to refrain from interfering with the content of the information in SHIFT. Hence the managing organization will not evaluate the quality of the information in any way and multiple “truths” are accepted. The idea is that the SHIFT community will constitute a self-correcting environment. The SHIFT philosophy holds that the risk of false information is outweighed by the benefit derived from the open source environment. In the end, however, users will be required to exercise judgment when reviewing information, and decide for themselves whether to accept any individual piece of data.

2.3.3. SHIFT is based upon trust

SHIFT is based upon trust, this includes:

- Users trusting the SHIFT organization
- Users trusting other users
- Users trusting the information in SHIFT

Users’ trust in the SHIFT organization is a fundamental characteristic guiding the SHIFT design. This relates both to a proper information management in SHIFT and a guarantee of smooth and sustained operation. The trust in proper information handling is primarily achieved by assuring the independence and neutrality of the SHIFT organization. An important business rule of SHIFT is to abstain from any assessment of information content (except clear violation of agreed business rules e.g. spam or advertisements). Although trust in SHIFT will only grow over time, the manner in which the organization is set up and functions is a key element in building this trust. Becoming well known through consistent activity over a long time is an ambition of the SHIFT organization.

Trust between the users will initially build on existing relations within the SHIFT community. It is envisaged that trust will be further developed through the extensive information sharing encouraged in the SHIFT concept. By creating communities of interest between selected trusted partners of the SHIFT community, information sharing and collaboration based on a high degree of trust can be achieved. User ratings of trustworthiness may help to create trust.

The SHIFT community is itself responsible for the trustworthiness of the information in SHIFT. All information posted in SHIFT is labeled with time and the identity of the poster. This traceability is believed to significantly increase trust in the SHIFT information. Through different validation mechanisms offered to the users, improved trust in the information may be created. Information in clear violation of agreed business rules e.g. spam or advertisements will be removed by the SHIFT organization. This may also contribute to the general trust in the SHIFT information pool.

As a service provider in search of “becoming well known through consistent activity over time”, maintaining SHIFT’s actual relevance to day-to-day operations and decision-making is as important as its perceived neutrality. In fact, developing trust is dependent not only on neutrality, but also practical utility. These two objectives are inextricably linked. Balancing them is a matter of leadership

2.4. SHIFT community

The SHIFT community will be composed of users representing many different kinds of actors in society. While SHIFT will likely reach its full potential in crisis or emergency environments, it can also exist, in a basic form at least, within pre-conflict societies. Examples of potential SHIFT users include, but are not limited to, individuals from:

- international and local humanitarian organizations
- local authorities
- international financial institutions
- reconstruction and development agencies
- intergovernmental organizations
- civilian crisis management missions
- representatives of national governments
- private enterprises
- emergency services organizations
- political parties and other organizations
- academic entities
- media
- military organizations
- religious communities

When applying for an access to SHIFT from the organization responsible for its functioning, it will be verified whether the individual represents the respective organization and could reasonably benefit from the participation.

2.4.1. User access criteria

The structure of SHIFT should be based on the principles that every user has one user account which is granted by the SHIFT organization, and every user has equal rights to use SHIFT. User accounts are identified with – at the minimum - six attributes: name, main function, organization and its category, thematic area of interest and geographical area of interest. Limitations to access should be very few, with the widest possible SHIFT community being encouraged.

2.4.2. Self-organizing groups

Information that is published in SHIFT is open to all SHIFT users. However, users may invite a selected group of users to participate in closed collaborative meetings. Possible products of the meeting can then be published in SHIFT if so decided in the meeting. The SHIFT environment provides tools that facilitate the formation of self-defined and self-organized groups, some of which will undoubtedly cross traditional organizational lines. These communities of interest will then further develop the content available in SHIFT, both to themselves and to other users in the community.

2.5. Information value

The primary purpose of SHIFT is information sharing, with the synthetic environment at the heart of the system designed to allow this to take place in a number of different ways. Information sharing needs are seen as falling into two broad categories, long-term value information and short-term value information. Actors' information interests can be categorized in several ways, e.g., based on timeliness, information content, the role of a particular actor, or the phase of activity. Information sharing interests also differ from one situation to another and from one actor to another. Information sharing situations are complex in nature and all these diverse interests exist during a situation where actors are involved.

2.5.1. Short-term value information

Short-term value information is information which has a need for immediate distribution, and which is time-sensitive. The majority of short-term value information will most likely concern safety and security issues, the sharing of which will contribute to a greater ability to manage and react to risks on the part of participants. An example of this kind of information would be the location, activities and possible intentions of a demonstration. Short-term value information becomes part of long-term value information or historical data once it is no longer topical. Even for organizations that are reluctant to collaborate with others, it should be clear that the sharing of this sort of information would be in everyone's interest. The major tool used to share short-term value information will be a Situational Picture (COP, Common Operational Picture).

2.5.2. Long-term value information

Long-term value information includes historical data, assessments, plans and intentions, contact and resource lists, and other non-time sensitive information. The intent of sharing this information is to allow for organizations to harmonize their efforts, and additionally to benefit from each other's experiences. Although every organization will use the basic tools and information within the SHIFT in different ways, uses of long-term value information is seen as falling into three main categories of activity i.e. planning, acting (execution/management) and assessing.

The tools and structure of SHIFT have been designed with these activities in mind; though the overall framework is flexible enough to allow each user to customize his/her approach to each activity.

2.6. SHIFT implementation

SHIFT concept ideas can be implemented in various different settings using different organizational approaches and different technologies. As a continuous concept development, SHIFT guides also other solutions towards more open and transparent information sharing.

Successful initiatives require top management commitment to support and direct the activities ensuring alignment with the SHIFT vision, strategy, and business objectives. The first step in operationalizing the SHIFT Concept is in the leadership setting the tone by clarifying its goals and purposes, which essentially are based on the philosophy and values of the organization.

In the beginning the SHIFT implementation is expected to support relatively limited amount of subject matter experts and actors in the field and then grow little by little to cover more areas and communities of interest.

2.6.1. Implementation process

The implementation has always the contextual and circumstantial criticalities, which have major influence to the process. Following process phases may occur also parallel or simultaneously.

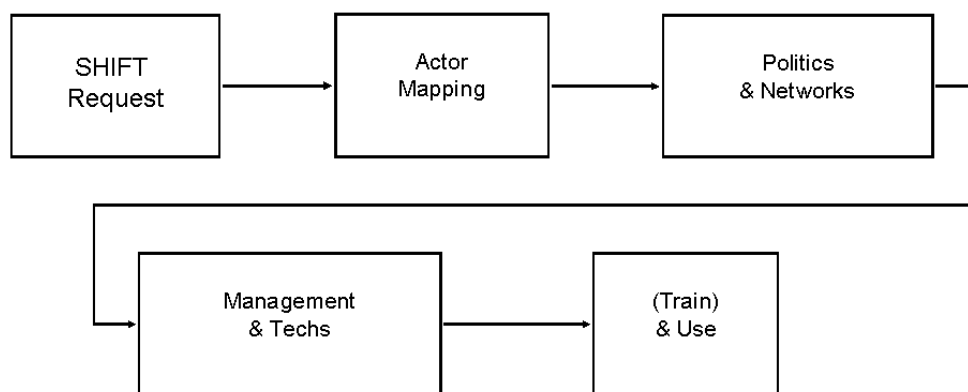


Figure 3. The implementation process

SHIFT request

The need for information sharing concept and/or tools starts the SHIFT implementation process. The request might come from various actors and stakeholders. Therefore first restrictions and requirements for the use of concept and tools are made.

Actor Mapping

Actor mapping is the first operative phase in the implementation process. It is done in order to understand the actual circumstances, relevant actors (SHIFT users) and the SHIFT system requirements.

Politics & Networking

This phase focuses in adjusting the SHIFT targets and mission targets. That requires networking with key actors and sharing the idea of possibilities of SHIFT. Marketing and representing the system and its possibilities are important sub processes. The desired end state is to have common understanding about the SHIFT's role in the mission and especially in information sharing processes.

Management & Tech

All relevant actors will have their user accounts and passwords. Simultaneously technical requirements and support are delivered for the users.

Using the SHIFT

This phase and the previous one include also training in required extend. The main idea is that all the users can start information sharing instantly and learning while using the system, instead of getting a formal training before being able to start using the system. The use of SHIFT is presented elsewhere in the concept. The use of the concept and tools has an impact to the previous phases of the process. That allows the improvement and learning process for the concepts and detailed lessons learned procedures.

3. SHIFT organization [SHIFTorg]

SHIFT organization (SHIFTorg) is the entity that provides SHIFT service to the customers. SHIFTorg will act as an administrator, moderator and facilitator of SHIFT. Also training the actors to use the environment is its major responsibility. SHIFTorg will manage the technical environment and is responsible for integrating existing information sources and services to SHIFT.

SHIFTorg will consist of staff that will operate SHIFT in any pre-conflict, conflict or post-conflict area or in an area affected by a natural disaster. Some technical features could be operated from outside of the area, while due to latency issues, some technical services may need to be hosted in the area.

SHIFTorg's role and interoperability with existing resources is meaningless if the intended end-users/clients within the stakeholders / partners are not aware of its practical application and utility. SHIFTorg leaders at appropriate levels should therefore ensure that an appropriate level of awareness-raising and training pertaining to SHIFT's role is imparted to the external stakeholders / partners prior to any deployment. There is a key role for the SHIFTorg in the implementation -phase as described in previous chapter.

3.1. Characteristics

The SHIFTorg has to be an organization that can be trusted by all (or as many as possible) actors involved. It should also be considered as an impartial information broker having no other agenda in the field than running SHIFT. It must always be considered a neutral entity.

The SHIFTorg should have a clear mandate from its users. It should be independent, having no allegiances to any other organization with an agenda in the actual operations. The SHIFTorg should be unaffected if any major organization(s) were to withdraw from using SHIFT or were to refuse to continue cooperation. It must be able to protect itself from criticism and attacks, and must be able to weather the dissatisfaction of powerful users. SHIFT will be impartial, i.e., it will support all customers/actors.

The SHIFTorg should also have a facilitating role in running SHIFT. As such, SHIFTorg should not influence any users to do anything against their will, but rather provide opportunities for them to share information and collaborate with each other.

Since SHIFT will be a user-defined information sharing environment, the characteristics of the SHIFTorg should reflect attributes that support such an environment. SHIFTorg will be transparent, as open as possible, agile and flexible to be able to adjust to the needs of the users/customers. At the end of the day, the users and the using of SHIFT will define the structure and processes that SHIFT will have.

Although SHIFTOrg will be independent, it still needs to be sustainable. Sustainability even in severe conditions must be guaranteed by the international donor community and the participating actors.

3.2. SHIFTOrg roles

The SHIFT organisation has the responsibility to provide user accounts to enable information sharing and collaboration in SHIFT. It provides operational help desk for the users and ensures that the actors are able to use the tools as part of the information sharing processes. Furthermore, it aims prevent the misuse of SHIFT in terms of false identities, feeding misinformation, etc.

The SHIFTOrg has the authority to enforce the business rules of SHIFT, responsibility to keep the environment a friendly place, free of personal insults and keep the information sharing environment clean and properly used. SHIFTOrg can move files and discussions to different sections of the forum, close discussions, and help people with problems using SHIFT.

SHIFT is a user driven and user-moderated environment. However, SHIFTOrg will need to be a focal point in facilitating information gathering and submission to SHIFT. The SHIFTOrg is the point of contact, for example, for the submission of information by a user who does not have an access to the system. The SHIFTOrg may be contacted by phone, SMS, e-mail or even oral reporting, and the SHIFTOrg will pass the information to the system. This will mainly be in the context of short-term value information, e.g., incident reporting.

Interoperability in the context of SHIFT is understood to require adopting and promoting common policies, information-exchange procedures, and technical interfaces acceptable to a wide range of external stakeholders / partners. It can be defined as the effective sharing of information and work processes across systems and organizational boundaries. Establishing and maintaining an appropriate level of interoperability should one the core tasks for SHIFTOrg. As a result, Operational complementarities and differentiation with local and international actors in time of emergency /crisis could be then achieved.

In technical terms, SHIFTOrg upholds the SHIFTech. It will integrate the technical services into one coherent information environment and makes, buys or use the actual applications, software and hardware to provide the technical service. Furthermore, SHIFTOrg will test all services and maintain the quality of service.

Some features and roles of users working under the SHIFTOrg umbrella are yet to be refined. SHIFTOrg could for example provide *Inter-sector Analysis - functionality*. SHIFTOrg could assume a leading role in facilitating and promoting Inter-sector Analysis, providing analytical complementarities with other actors. With a view to maintaining its position of neutrality, SHIFT should rely on external stakeholder / partners to identify priority information and analytical requirements, then act as catalyst and 'synapse' (not source) between existing analytical capacities.

Analytical complementarities to local and international actors in time of emergency / crisis would be the result of this capacity. Detailed information concerning for example administrative, moderating or technical helpdesk features issues are explained in the SHIFT Handbook.

3.3. The role of SHIFT Board

An effective placement of SHIFToTorg in the broader value-chain would support directly:

- recognizing and incorporating the role of external stakeholder / partners;
- addressing all relevant stages of crisis and crisis response; and
- incorporating global trends in Information Management.

This approach makes it possible to place SHIFT as one actor among many in a broader ‘information management value chain’ that is predicated on a shared value proposition of improving the usefulness of information to the ultimate users. Determining this placement with the broader and evolving operating environment, and SHIFT’s differentiated and complementary position within it is considered crucial in determining the long-term durability of the model. It also has profound implications for the operating / business model to be adopted, and what is to be expected of SHIFToTorg’s leadership and management.

Irrespective of which products and services a future SHIFToTorg will eventually deliver, or in which manner country-level conditions vary (different cooperation capacities, man-made or natural disasters, etc.), it is recommended for SHIFToTorg at the global level to be established as an Intergovernmental Organization with recognized diplomatic status.

When implemented, SHIFToTorg will have a steering board, which will ultimately make decisions and commitments on behalf of SHIFT. Ongoing funding will be a key feature of SHIFT and SHIFToTorg, as it directly affects the sustainability of SHIFT. Therefore the funding is the main responsibility of the SHIFT Board. Board may consist of the major actor representatives in the region – United Nations being often the most obvious participant.

4. SHIFT Technology

Several technical approaches could be used to implement SHIFT in the field. This chapter describes the general approach that utilizes Web-based SOA-capable services with clearly defined system architecture, standards and design principles. Web services and Service Oriented Architecture (SOA) provide the best interoperability between services and guarantee easy access to services

4.1. SHIFTech development principles

4.1.1. Development approach

SHIFT system is developed using an iterative development approach. Iterative development allows the system to be improved in short (3 – 4 months) implementation phases, in which a prioritized set of new or improved functionality is developed.

SHIFT users can continuously suggest improvements or new functionality to the system. The improvement ideas are first harmonized and prioritized by SHIFTOrg, which then together with the technical integrator plans the future iterations and places the required improvements to them.

The focus of the first SHIFT implementation phase has been on the developing the SHIFT platform and the basic functionalities. In the next phases the functionalities and platform are improved based on the users' feedback. There will be also development around the currently defined SHIFT Processes. From the system availability point of view, the SHIFT system has been in the first phase developed for good network connection locations and office conditions. In the future also the requirements of the slower connections and field conditions are covered.

4.1.2. Architecture

The corner stones of the SHIFTech architecture are the Service Orientation and the usage of Commercial off the Shelf -products and open standards.

In Service Oriented Architecture approach the architecture builds of functional and technical services, which provide the required functionalities for the users. The main objective of the SOA approach is the architectural flexibility which allows the architecture to keep up with the changes in the organizations' operational environment and requirements.

The architectural flexibility is achieved by loosely coupling the SHIFT services. This means that there are no such dependencies between services, which would require other services to change when one service is developed.

The SOA approach also provides better means to ensure the SHIFT availability and the quality of service. This is achieved by service orchestration in which the service is provided to the user from the best possible available location.

The main advantage of the COTS -products is the availability of the product support organization which takes care of the development of the product main functionalities and also solves the possible problems and errors in the product. The COTS -products also have a foreseeable development path, which eases the road mapping the SHIFT development.

The usage of the open standards ensures that the new products and services can be easily added to the SHIFT architecture and also that SHIFT can be easily integrated to other systems, which support the same standards. Usage of the open and well know standards and coding languages ensure also the availability of development resources.

The open source products are considered case-by-case in the architecture and are used where appropriate. The main downside of the open source products is the lack of official product support organization, which requires the maintenance and support organization to be built inside your own development organization.

4.2. SHIFT as an information sharing tool

Figure 4 below shows the functionalities of SHIFT. However, SHIFT is much more than a set of tools used separately. The very essential characteristic of SHIFT is the added value that comes from the use of multiple functions at the same time and linked with each others.

For example the Communication functionality that enables both real-time Virtual meetings and non-real-time connections between users, can also be linked to Situational Picture or any other service (also outside SHIFT). On the White Board of VC the user can open Situational Picture or even Google Earth instead. One can show his/her PowerPoint -presentations of videos to other participants of the meeting. SHIFTpedia is available for storing the documentation as well as retrieval of materials needed in the meeting.

Another example about the links between functionalities is the link from Event Management to Situational Picture and vice versa. Whenever a new report arrives to the Event Management it is immediately visualized as a symbol on the SP map. And whenever a user wants to know more about an object represented as a map symbol, the data can be retrieved from EM database and shown to the user. Metadata about the reported events is an important part of information contents and for example when several reports exists about one event; SHIFToorg is able to update the event database.

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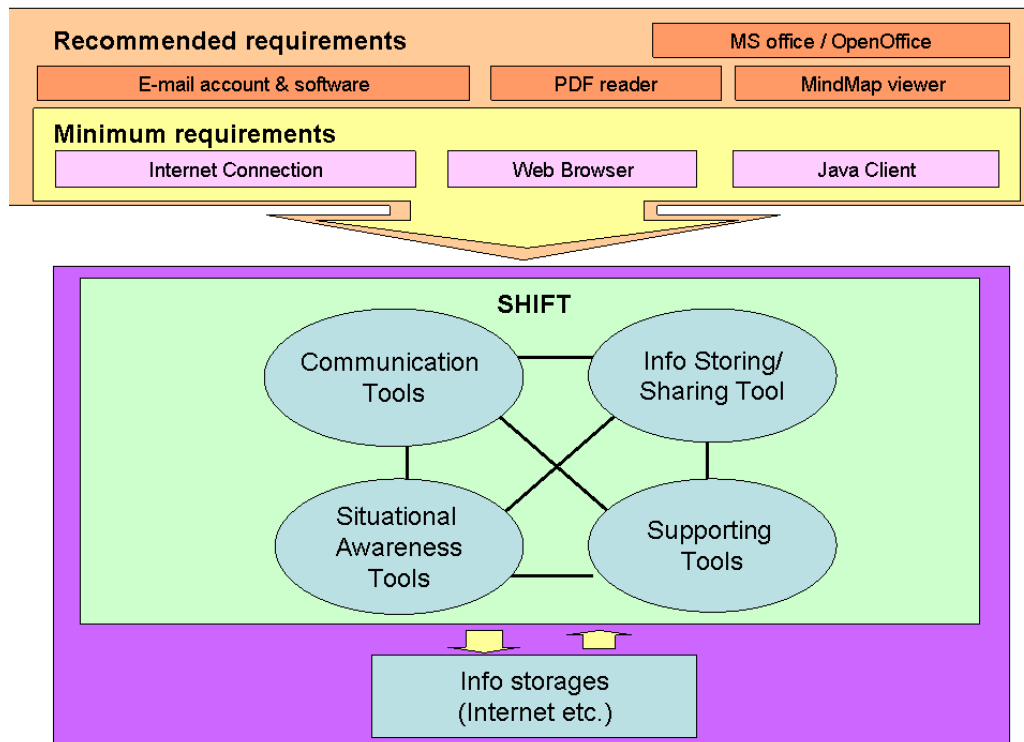


Figure 4: SHIFT technical services and requirements

4.3. Communication tools

4.3.1. Real-time communication functionalities

SHIFT offers an interactive way to collaborate in real-time. This type of Unified Communication and Collaboration (UC2) capabilities provides the most effective way to share information, presentation and discuss the ideas with the colleagues and other interested parties. The offered set of UC2 tools helps actors and their organizations to reduce travel costs and burdens, decrease response times, and improve the abilities for solving existing problems. It also enables those experts unable to travel to the site of mission, however to be used as extra sources of knowledge; this can happen on basis of alarm -type email sent to those external experts.

Enabling a Web Conferencing: audio, video, file sharing, whiteboard, group chat and application sharing gives a flexible way to learn about previous mistakes when actor groups can record and archive the information for later analyses. Even if all published information is open to all users, Web Conferencing may be used in SHIFT among small groups to share more sensitive information.

Instant Messaging (IM): audio, video and file sharing will give point to point chat capabilities between different authorities. It gives a quick view of who among your chosen correspondents is logged onto the SHIFT service at any given time. IM can also show the actors' awareness.

4.3.2. Non-real-time communication functions

Discussion board is non-real-time communication tool and it is used for long lasting discussions among community where real-time communication is not required. Discussions are stored for the later use. Discussions are threaded: in other words, the relationship between a message and the responses posted to it is displayed graphically on screen in a way that gives a meaningful structure to a discussion or activity.

4.4. Information storing tools

SHIFT offers resources for dynamic information management. SHIFTpedia is a Wikipedia -type of collaborative and interactive too. Any authenticated user, identified as a person, organization or anonymous, may provide content to SHIFTpedia system, where storing, organizing and linking of the data is possible. The added content - text, image or spreadsheet data - is stored hierarchically and can be formatted, if needed. Also separate files can be attached to the pages. The content can be commented and edited further by other users.

The Document Management System (DMS) provides tools for finding stored content from the SHIFT environment, based on the added metadata. Typical metadata elements are the creator of the document, content keywords, creation date or file format. Also versioning tools are available to manage the multi-user document editing.

4.5. Situational awareness tools

In the SHIFT Situational Picture component the user can input and view information that includes location information so that it can be presented on map. Actors can share their plans and assessments using a map interface.

Information is stored in the system using fixed forms and standard mark-up language (for example xml-forms). Information is structured, based on predefined, hierarchically organized concepts such as alert, incident, infrastructure, unit, report etc.

The objects in the situational picture are mainly point objects, but areas and linear objects may also be presented. The objects are presented in the map using map symbology that consists of hierarchically structured, but still pictographical -point symbols. Visual design of the symbols is as much as possible value independent and culture independent as well as correctly understandable by the users.

The history of all events is saved, which enables the analysis of the situation afterwards.

The Situational Picture is scalable according to the user's needs. The content can be filtered according to information source, regional, functional or temporal criteria.

Information objects in the Situational Picture can be linked to each other. By adding this kind of knowledge about the relationships between objects the creation of wider situational awareness can be supported. For example an alert can be linked to a confirmed incident and a person on site can make a status report that is linked into several incidents. Also external data sources can be linked into the forms (web-camera, website, discussion board and so on).

Situational Picture component offers interfaces to external data sources. This enables the importing and presentation of data from other sources using for example GeoRSS feeds (RSS feed with location information). The information in the SHIFT situational picture can also be exported to other services.

4.5.1. Map interface and GIS services

Situational Picture tool offers SHIFT users a map interface to the existing situation. The quality and accuracy of the maps depend on the acquired material. The used technology enables the use of all kinds of material i.e. raster maps, vector maps, satellite images as well as aerial images and drawings. A metadata about map quality is essential information and it can be presented as well.

Geographic Information System (GIS) services offered by SHIFT can include a selected set of analyses like risk assessment for planning purposes.

4.5.2. Event management

Incidents and other events are stored into a database. Each object description includes also a standardized metadata description. Among others metadata is about the quality of the information.

Information in Situational Picture tool can also be viewed as lists. This enables the usability of the information when the available bandwidth is low.

4.6. Supporting tools

SHIFT service includes *availability* features, so that names of SHIFT users can appear in SHIFT awareness portlet as hyperlinks that allow users to contact persons with whom they might want to work. Wherever a person link appears, actors can click the link to display a menu of actions for collaborating (contacting and working) with the person named by the link. This Availability can also indicate whether a person is active.

Organization and Person Discovery is centralized person search-service, which gives users the ability to search right organizations and experts based on their needs. It also gives a centralized way to update user and organization profiles.

Notification is a message sent to a user by SHIFT intelligent Notification Service. This message can be either a direct notification, originating from another user or application, or it can be a notification based on a subscription, that an actor has subscribed. Notifications are sent to users via delivery channels. Delivery channels are mechanisms for receiving messages, such as portlets, Lotus Sametime and e-mail. Actors can set preferences that affect when, how, and with which delivery channels the users are notified.

Group Calendar gives possibilities to manage events, meetings, deadlines, tasks, announcements and more for particular missions. In this way it is easy to get an overview of all those tasks what is happening around each mission.

Federated Search allows actors to search multiple data sources, within SHIFT, with a single query from a single user interface. The actors' types in a search query in the portal interface's search box and the query is sent to every individual database in the portal or federated search list.

4.7. SHIFT and the world around it

The idea in SHIFT is to enable networking among the actors by offering a set of collaboration and other tools. SHIFT is also based on open interfaces which allow easier technical integration with other systems. SHIFT is not an isolated group of people but it allows contacts with different web sites of organizations and individuals, enables the retrieval of data from remote data bases as well as allows the use of functional services of specialized service providers around the world.

SHIFT Shared Information Framework and Technology

Any useful web sites: A list of most reliable and useful web sites can be published in SHIFT and users can also suggest new ones, that they have found useful, to be added to the list. For example web sites of meteorological organizations publishing weather forecasts, web sites of newspapers publishing latest news or web sites of National Mapping Organizations that might offer interesting information about the area of interest could be included in SHIFT.

Google -type of services are offering *both spatial and non-spatial data retrieval*. Google Earth or Google Maps is an example of a useful service in case of no other geographical data is available. Google search offers a well-known and useful data source for any information need, but in SHIFT the services available are not limited to a particular one.

The SHIFT authorized geographical data bases are used for the background maps of the situational picture -tool.

Data and application services: most likely these kinds of services are “pre selected” by SHIFToorg, but user can of course suggest new ones. If accepted, then they will be available as portlets for everyone. The user can for example perform GIS analyses like “what is the shortest path?”, or “what is the mobility of the terrain?” or even view “a risk level map presentation” by using the SHIFT authorized map data together with some selected spatial analysis services.

Alerts or notifications: any SHIFT user who wants to be informed about activities on some specific missions can get an alert -type of information email. This allows actors to be working offline from SHIFT, but being informed if something of their interest is happening in SHIFT or they can be notified when their expertise is required.

5. SHIFT processes

This document describes the ideal situation to where SHIFT processes should be developed into in order to meet the SHIFT concept and user needs. The purpose is to describe the idea how SHIFT is being used so that the concept and the technology would meet and satisfy user needs as well. SHIFT processes are described so that SHIFT services could be adequately exploited. Technology should be flexible enough so that it supports the use of shift in various crisis situations between different types of actors. Processes aren't decision making processes but they are guidelines of how to use SHIFT and how the technology should support it. The document is for MNE5 purposes only.

In this document following terms are used in definition given below.

Actor: person or organization using SHIFT.

SHIFTorg: the SHIFT as service provider, different entities inside SHIFT are not specified here (such as SHIFTtech etc.)

The main SHIFT processes are:

User management processes includes the registration process from account creation to entering the community and account cancellation. All actors involved to SHIFT must introduce themselves by adding actor description.

Information sharing processes describe how actors communicate inside the SHIFT by finding relevant information and actors, forming communities of interest and publishing information. Information sharing has different needs in different situations and there are various tools to support it.

Administrative processes describe the processes not visible to normal actor and are mainly service maintenance processes. These processes concern mainly SHIFTorg.

These processes are described in more detail in this document.

5.1. User management processes

User management processes describe the access processes related to SHIFT as well as account and profile management from user point of view.

5.1.1. Registration

If actor would like to have access to SHIFT, registration is needed. Actor needs a sponsor i.e. an actor who already has an account as a referee. By recommending an actor one can ensure at least in some extent that the actor is who he claims to be. The registration process should be simple and fast.

Signing up to SHIFT

Signing up is done only once when actor creates an account. When signing up basic profile information is requested. This includes the necessary elements such as actor name, email, password and accepting terms and conditions. Only limited information is requested here, additional info can be given and updated later in SHIFT. All actors are equal; there are not limitations on the use of SHIFT based on registration.

Entering the community/Logging in

When actor is given an account and logs in to the SHIFT for the first time additional information about the actor needs to be given. This information is used as actor description as well as metadata for the search functions to facilitate the searching of collaboration actors. Some basic information is open to all actors inside SHIFT. There should be possibility to define the levels of publicity of actor information. All actors can see basic information but actors inside selected networks could see more detailed information. Some information such as keywords regarding areas of interest is used to enhance the search functions. Keywords for example should be defined in ontology so that same keywords are used.

Some general information must be given and actors are recommended to share information concerning them. Below are some information classes with some possible examples. The information should be described in more detail in metadata and ontology work.

- Basic information (name, gender, location, picture)
- Contact information (email, mobile number, address, messenger, web pages, organization)
- Organization information
 - What does my organization believe in? (values)
 - Why my organization exists? (mission and vision)
 - What my organization does? (task)
 - Where is my organization going to go? (possible end-states of activities)
 - How do we reach our goals? (action patterns and means)
 - What is my organization like? (features of the organization)
 - What are my organizations resources? (resource information)
 - Experience (education, work, position)

- Areas of interest (expertise keywords and an additional information whether the actors offers or needs help and whether the need of help is immediate or not)
- Actor location information, area of interest or action etc. Should be dynamic and described in various ways (words, areas, coordinates etc.)

5.1.2. Actor profile information and privacy

All actor profile descriptions can be edited later. Actors are encouraged to share information concerning them (list above). This information is used in finding collaboration partners and to help information sharing.

Actor can also decide the privacy level of the profile. Some more detailed information can be shared only with networked actors.

There should be possibility also to block some actors from browsing actor's information. These actors can be for example actors that are suspected to misuse the system or act in some other harmful way. The blocked actor might still be part of the SHIFT, but could not browse that certain actor's profile.

5.1.3. Actor account cancellation

The SHIFToorg can cancel actor rights in case of misuse of the SHIFT system. This requires strong reasons such as continuous misuse of the system and other harmful actions. The actors themselves need a possibility to question the information as a potential misinformation. Actors should be able to give feedback on other actors as a way of user moderation. Actor can also have their own account removed at any point if they will so.

5.2. Information sharing processes

SHIFT is about social networking and information sharing among all relevant actors in crisis management situations. Information sharing processes are the core processes of SHIFT. Information sharing processes describe how actor can find those to share information with and how to best exploit the SHIFT system to meet ones needs. The goal is that actor's information exchange level raises and communication among different actors is facilitated. Information sharing processes describe how information is searched and published in the SHIFT, how to collaborate in SHIFT and how information can be exchanged between different systems.

5.2.1. Building and managing networks

The list of all actors and some basic information is public to all inside the SHIFT. The first thing is to build the network that the actor already has. This should also include the possibility to invite actors that are not in the SHIFT yet. The search of actors should be possible with keywords such as name, function, organization, location, and areas of interest. The metadata descriptions are in essential role in here. Actor can decide how public this capability is by selecting suitable privacy settings

Actor can send a request to other actor to add as contact. The network is being built and it can be managed later on. Actors can be removed from contacts and there could be also different levels of contacts such as limited and inside network. The system should suggest some other contacts based on the network actor have and also based on keywords provided. Actors can also recommend actors to others.

5.2.2. Collaboration

Actor can also search for Communities of Interest (COI) and find collaboration actors also this way. A COI is a group where different actors with some common interest can share collaboration supportive information. Everybody can form a COI and they can be open to all or to some limited actor group. Actor can belong to one or more COI's. These COI's are so called subSHIFTs.

Searching for actors to collaborate with and areas of interest

When actor enters the SHIFT actor starts to search for actors or COI's that it finds useful to its actions. The metadata provided when entering the SHIFT for the first time helps in this. All actors and COI's should be described with metadata so that finding information is more efficient. System should learn actors' areas of interest when using the system and then starting to suggest possibly interesting information as well. Actor can browse or search for other actors and COI's for example by keyword, organization or location.

Establishing Community of Interest and receiving collaboration request

Actor can generate new COI where selected or all actors can share information. Other actors can also send requests to join in to other COI's. A COI is collaboration area where information is gathered in certain place and information management is easier. If a COI is publicly listed then some basic information is given to describe the COI to all inside SHIFT. COI can be open to all, by invitation only, visible to all or visible only to actors belonging to that COI. The COI can have similar privacy settings as an actor profile and in addition the possibility to see the actors belonging to the COI can be selected.

Collaborating

There are several ways how actors can exchange information and collaborate in SHIFT. Actors can share their intentions, possible restrictions in the field, some facts to stop rumor, incident information, security related info etc. Different tools make it possible to share different levels of information with different audience. It is not necessary to share everything to everybody, but choose tools best fit to the situation.

Crisis and actors actions have several phases where different types of collaboration take place. Here possible collaboration scenarios have been divided into 1) Situation evaluation, 2) intention discussion, 3) activity discussion, 4) activity management and 5) evaluation discussion. Different types of information are shared in each situation and requirements differ from situation to situation. Note that these discussions can be held in SHIFT as general or in smaller communities of interest inside SHIFT.

SHIFT provides different toolset to facilitate collaboration, such as static databank and forums (WIKI), virtual meeting tool and situation picture.

1) Situation evaluation/assessment meeting

When actors come to the place and connect to SHIFT meetings can be organized. The first meeting is on situation evaluation/situation assessment. Situation evaluation meeting can be called up by any actor. In situation evaluation meeting various actors try to get common understanding of the situation in the area. Situation picture is in major role and collaboration tool is used for the meeting. WIKI provides a tool for documentation of the meeting and relevant information. Risk map can be a part of this.

Input: Situation picture.

Output: Common understanding of the situation, possible risk map can be included.

2) Intention Discussion

Intention Discussion is a method to share and compare the intentions of the organizations participating in the SHIFT. Goal of the intention discussion is to enable the initiator organization sharing its intentions and create a common understanding about the intentions of the participating organizations. There may be differences and opposing opinions which are captured. The goal is not to harmonize intentions.

Input information to this process: intentions of one or several organizations. Only organizational role can be used to publish these. The discussion has the following steps:

- initiator publishes and calls a meeting (intention publishing and discussion initiative)
- SHIFT community discusses upon the intention in WIKI and Virtual meeting; analysis support and simulations may be used to investigate the future effects (editing and interpolating the initiators intentions)
- Matured intentions are published in WIKI

Output information from this process: list of edited and interpolated intentions in the WIKI.

3) Activity Discussion

Activity Discussion is a method to share information about the future activities. Goal of activity discussion is to enable any SHIFT actor to publish their future activities in a sensitive way, find other parties that are interested about the same areas and activities and host a (normally closed) discussion with those actors sharing similar needs.

Input information for this process is: activities of one or several organizations, also an anonymous role can be used; there might be two circles with different participants and roles.

Substeps in the process are:

- Initiator publishes activities in sensitive manner, others see this and can start discussion (activity publishing and discussion initiative),
- starting the discussion with anonymous publisher (needs to be solved) (SHIFTorg role?), openness should be encouraged but discussion can be closed and even not published (discussion about the intentions in order to interoperate with them)
- parties publish their actions in Situation picture.

Output information of the process: Future interoperable actions.

4) Activity Management

Activity Management is a method to monitor current activities and reach them. The goal of the Activity Management is to provide validated situational picture and resource information about the ongoing activities. If some corrections are needed, the actions taken are supported by WIKI and virtual meeting.

Substeps of the process include Situational Picture

Output information of the process: Validated and timely situational picture.

5) Evaluation/Assessment Discussion

After execution/implementation of activities an assessment meeting can be held. In this meeting the successfulness of the actions is discussed. Some measurements can be used. The main source for evaluation may be media. The situation can also be evaluated from the risk map point of view (risk map is one measure that can be used in assessment): did the risk levels change (decrease) in the area?

Evaluation Discussion is a method to publish and evaluate the effects in the system and comment them. The goal of the Evaluation Discussion is to enable any actor in SHIFT to share their evaluations and/or make common evaluations (comparable to Intention Discussion and/or call an evaluation of an effect. Goal is not to harmonize the evaluations, rather to comment and add to them.

Input information: Intentions and evaluations, also anonymous role can be used.

Substeps of this process can not be defined in theory, they need to be defined and tested in exercises.

Output information: Commented/formed evaluations.

5.2.3. Communication between separate systems

SHIFT doesn't replace any present or organization system. Organization has to be represented in SHIFT in order to be able to share information with SHIFT community. In following the communication between coalition Knowledge Support and SHIFT is described as an example. This can be generic knowledge request/information sharing process between SHIFT and any other domain expert community.

Knowledge/Information request from SHIFT to KS/KD

Actor in SHIFT community wishes to receive knowledge or information from coalition.

Input: need for knowledge in SHIFT community

Substeps:

- SHIFT actor recognizes the information need
- Using people discovery actor looks up coalition liaison officer (Knowledge Support manager/ CIMIC Point Of Contact, POC/ NGO liaison officer), or finds the right POC by searching with keywords
- information request/exchange is done by launching virtual meeting/text chat or in a Community of Interest or by posting question to knowledge request area

Inside coalition:

- response is done according to coalition information releasing procedure and policy
- KD decides on which requests it answers and publishes it if it's seen appropriate
- KD is responsible of the information security concerning its information products
- All SHIFT community members have right to make knowledge request to KD, but KD decides will it be answered
- Coalition side workflow is based on coalition knowledge request procedure, where e.g. will be determined if the SHIFT user requested information can be released and published in SHIFT environment

Output: SHIFT user receives required information/knowledge from coalition depending on confidentiality of the information

The knowledge request process is under development and this information should be seen only as an example of it.

Information request from KS to SHIFT

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Actor from coalitions Knowledge Support Center requests information from SHIFT community. This can be done by sending COI request to relevant actors inside SHIFT, posting a knowledge request or by contacting directly a relevant actor in SHIFT. Actors then exchange information by using suitable communication tools or means in SHIFT.

Input:

Need of knowledge from SHIFT community members

Substeps of the process are:

In SHIFT

- CIP/CIME representative/CIMIC/NGO liaison
 - posts a knowledge request to WIKIs knowledge request area, or
 - Searches or generates COI with relevant actors, or
 - Searches for relevant actor from people discovery
- In WIKI posts a knowledge request to be replied
- Discusses with relevant actors inside a COI
- Contacts an actor with for example virtual meeting chat and requests information
- SHIFT actor(s) reply if they can help or find it relevant to them, otherwise the question remains open

The process continues as KD process according to coalition information releasing procedure and policy

- First validates the information if possible, publishes the product (information) and uses the information for system analysis

Output information from this process:

Knowledge/information to KD/KS from SHIFT actor(s)

5.2.4. Information and data management processes / Admin processes

Reference data collection

SHIFT services need maps, satellite images and aerial images. They can be searched in Internet, in the work case only Google earth is available as the reference map and background map for the situation picture service, NATO Vmap should also be available for the entire world. In most cases however national mapping agencies can offer reference maps. SHIFToorg is organizing access to these materials and they are linked to SHIFT portal. All possible metadata as well as quality information should be collected together with the data.

SHIFT situation picture and event information management

Situation picture and event data must have metadata and quality descriptions as well. The minimum metadata and quality descriptions must be defined as well as ontology.

Document management

For document information management there are already guidelines for MNE5 and they should be applied in SHIFT document management as well. This is part of metadata descriptions.

Providing basic information and help desk for the actors

SHIFTorg must provide information about new missions and new services in SHIFT. News should appear on the screen when the actor logs in. Help desk must be just behind a simple button. The user interface must be as simple as possible.

Information delivery to system from actors not members of SHIFT community (by SMS, email...)

It should be possible to add information to SHIFT also by contacting SHIFTorg. This is technologically driven solution.

6. Opportunities

SHIFT is an iterative process where customer feedback is essential in concept design, implementation, and modification. Therefore user feedback and quantitative measures are actively collected and analyzed on a routine basis to provide the best possible information exchange environment for the SHIFT user and ideas for how to solve the possible obstacles.

One key objective is to focus on the real-life requirements outside the MNE5 context, and to provide the development team with a 'reality check' by introducing the matrix of field-actors, initiatives, potential users, clients, and contributors currently operating in this area - as well as their (largely divergent) expectations and requirements.

Global warming, increasing number of natural disasters and disaster-prone countries, in combination with rising numbers and types of respondents, are undoubtedly increasing the demand for better co-operation and co-ordination mechanisms. Market demand for Information Management related to Disaster Preparedness, Response and related Humanitarian intervention is a growing phenomenon.

There is a trend of globalizing advanced communication cultures and technologies with a rapid pace. Familiarity with ICT processes continues to rapidly spread in the humanitarian community. The majority of respondents of a survey carried out for this project are regularly using online collaboration and mapping tools in their crisis response. The most of them believe that the integration of the commonly used communication features in one single web portal would meaningfully facilitate inter-agency communication and collaboration in crisis response.

Simply put, and on a practical level, getting the right information at the right time saves lives at all stages of an emergency / crisis. Not surprisingly, during and even after an emergency, agencies and the people that work in them are focused on carrying out relief and recovery activities within their own competence and mandates. They have limited motivation and few skills to obtain, manage and share data beyond their own purposes. In reality: Information Management is simply 'not their business'. While it may benefit then in the long run, this combination more often than not puts information sharing and interoperability at the bottom of most practitioner's and organization's lists of priorities.

This reality may be the opening SHIFT requires to differentiate itself from existing IM initiatives described above and provide value added.

Reaching the critical mass and added value. The environment is interesting for the users only if there is added value for participants. Getting the critical mass of actors to interact with each other inside SHIFT doesn't necessarily mean that in SHIFT you can find information that can not be found elsewhere. The actors can gain added value for example by collaborating with other relevant actors and thus utilizing their resources more effectively. The other point is that if you feel that you are missing something when left out then you rather be 'in' than 'out'.

Although various IM systems and increased interoperability capacities have been created and tested over the preceding decade, their actual deployment and application have been inconsistent and ad-hoc. And not many have been consistently put to actual use by organizations involved in national, cross-border and international crisis management.

There could be a lack of information when it is not openly shared among actors. The actors are to be encouraged to release their information also “without reasoning” while i.e. enabling them to keep their information source or analysis behind the information to themselves. This could also decrease possible security or releasability concerns that actors might have.

It is not yet decided whether some information inside SHIFT should be made possible to be browsed without an user account or not. However – if user wants to post or modify information one has to have an account. An account is also needed for participating to the meetings. This idea is still to be finalized and the mechanisms are not yet defined. There could also be a possibility that actors will use SHIFT for unethical purposes or in inappropriate manners. This can be overcome i.e. by user surveys and feedback, and by deactivating those accounts that are misusing the system. The role of SHIFToorg is important in this issue.

“Confidence value”. The confidence value of the information could be regarded as high when most of the relevant specialists in a particular area share the same opinion. Information value becomes then as “true as now”, or as “an assumed truth” but that can of course change in the course of time. There could be a mechanism that indicates when the information is mostly agreed upon instead of giving out the average value. This information value could be then the desired added value for the user.

Less staff is needed. The SHIFT Concept has the potential of providing an important institutional memory of the overall military (peace-keeping), humanitarian or economic interventions as other agencies phase out and others enter, each in line with their mandates. This complementary capacity can also serve as a collective knowledge base, in some measure compensating for traditionally high staff turnovers, combined with an over-reliance on personal experience and anecdotal evidence when making decisions.

SHIFT’s current and potential analysis and knowledge applications, and their potential contribution in this overall value-chain, lay more in the ‘application of information’ sector. SHIFT’s potential competitive advantage could lie in: 1) capturing, storing and transferring an informational base that has not been previously addressed in any systematic manner and 2) applying information in a unique way that has not been done before.

Finally, an impressive majority of respondents to the before mentioned survey believe that the integration of commonly used features in one single web portal would meaningfully facilitate inter-agency communication and collaboration in crisis response. SHIFT can in principle pre-deploy, and remain relevant throughout the various transition phases of emergency/crisis intervention from supporting first-responders through recovery.

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TERMS AND DEFINITIONS

COI - Community-of-Interest

“...are task oriented, and include data providers and/or consumers that share a common language. They are either expedient data-driven or institutional process-driven communities and can fall within one or more functional entity”

[Department of Defense Net-Centric Data Strategy, DoD-CIO, 2003]

COP - Common Operational Picture also

“Domain Description - The decentralized Common Operation Picture (COP) application consists of a set of organizations sharing real-time information with each other during an emergency response situation using a common operational picture. Since critical decisions made by each participating organization are based upon the real-time data received from other participant peers, it is important for each peer to establish trust relationships with each other in order to be able to judge the veracity and reliability of this data. Trust management thus plays a very significant role in this application.

Each organization in the COP application is composed of three types of modules: information gathering sources that observe events and report information to the command and control module, a command and control module that makes decisions based on both information received directly from its information gathering sources and information reported by other peers, and display units at the emergency location that receive instructions from the command and control module.”

[<http://www.isr.uci.edu/projects/pace/cop.html>]

GIS - Geographic Information System

Computerized system that relates and displays data collected from a geographic entity in the form of a map. The ability of GIS to overlay existing data with new information and display it in colour on a computer screen is used primarily to conduct analyses and make decisions related to geology, ecology, land use, demographics, transportation, and other domains, most of which relate to the human use of the physical environment. Through the process of geocoding, geographic data from a database is converted into images in the form of maps.

[Britannica Concise Encyclopedia]

NGO - Non-Governmental Organizations

“A non-governmental organization (NGO) is any non-profit, voluntary citizens' group which is organized on a local, national or international level. Task-oriented and driven by people with a common interest, NGOs perform a variety of service and humanitarian functions, bring citizen concerns to Governments, advocate and monitor policies and encourage political participation through provision of information. Some are organized around specific issues, such as human rights, environment or health. They provide analysis and expertise, serve as early warning mechanisms and help monitor and implement international agreements. Their relationship with offices and agencies of the United Nations system differs depending on their goals, their venue and the mandate of a particular institution.”

[www.ngo.org/ngoinfo/define.html]

MNE5 - Multinational Experimentation 5

“Multinational Experiment 5 (MNE 5) is the fifth in a series of experiments which explore the uses of international power to influence the behavior of adversaries and prevent or mitigate crisis. [...] The campaign uses a building block approach of seminars and limited objective experiments, distributed among a group of multinational partners, which lead up to three integrating events and a capstone event. This allows concepts and insights to emerge over the course of the experiment's campaign. [...] MNE 5's central theme is a comprehensive, whole-of-government, approach, using the effects-based approach to multinational operations to explore military support to various aspects of civilian interagency operations. By using a combination of national and international elements of power to influence a regional environment, participants will seek to broaden the context of pre-crisis and crisis management. The experiment will attempt to develop processes, organizational structures and/or technologies to support a comprehensive approach in securing a politically stable, economically sound environment by engaging interagency organizations, and increase interagency interaction with non-government organizations.”

[www.jfcom.mil/about/experiments/mne5.html]

Shared understanding

Shared understanding refers to mutual knowledge, mutual beliefs, and mutual assumptions

[Clark, H. H., & Brennan, S. E. (1991). Grounding in Communication. In Resnick, L. B., Levine, J. M., & Teasley, S. D. (Eds.) Perspectives on Socially Shared Cognition (pp. 127-149), Washington, DC: American Psychological Association.]

Situational awareness

An established definition of Situation Awareness is provided by Endsley (1988). She describes it as comprising three levels: level 1 perception of elements, level 2, comprehending what those elements mean and level 3, using that understanding to project future states.

[Endsley, M. R. 1988, Situation awareness global assessment technique (SAGAT). Proceedings of the National Aerospace and Electronics Conference (NAECON). (New York: IEEE), 789-795.]

Situational picture

See COP.

Information security

The protection of information against unauthorized disclosure, transfer, modification, or destruction, whether accidental or intentional. Term definition is taken from the MIL-STD-188 series of standards and their associated military handbook. This is not a source citation.

KM - Knowledge management

“Knowledge Management comprises a range of practices used by organizations to identify, create, represent, and distribute knowledge for reuse, awareness and learning.[...] Knowledge Management programs attempt to manage the process of creation (or identification), accumulation and application of knowledge across an organization. Knowledge Management, therefore, attempts to bring under one set of practices various strands of thought and practice relating to:

- intellectual capital and the knowledge worker in the knowledge economy
- the idea of the learning organization
- various enabling organizational practices, such as Communities of Practice and corporate Yellow Page directories for accessing key personnel and expertise
- various enabling technologies such as knowledge bases and expert systems, help desks, corporate intranets and extranets, Content Management, wikis and Document Management”

[en.wikipedia.org/wiki/Knowledge_management]

IM - Information management

“Information management is the collection and management of information from one or more sources and the distribution of that information to one or more audiences. This sometimes involves those who have a stake in, or a right to that information. Management means the organization of and control over the structure, processing and delivery of information.”

[en.wikipedia.org/wiki/Information_management]