Conceptualization of Military’s Common Operation Picture for the Enhancement of Disaster Preparedness and Response during Emergency and Communication Blackout

C. Kumsap\textsuperscript{a*}, V. Mungkung\textsuperscript{a}, I. Amatacheewa\textsuperscript{a}, T. Thanasomboon\textsuperscript{a}

\textsuperscript{a}Defence Technology Institute (Public Organization), 47/433, Pak kret, Nonthaburi 11120, Thailand

Abstract

The military's common operation picture (COP) is the concept where situation awareness is created before the eyes of high ranking commanders who gather remotely in a command and control headquarters to provide imperative advices and to make decision upon the emergency mission carried out by on-site soldiers. The underlying rationale is to integrate relevant technologies in order to enhance the situation awareness for disaster preparedness and quick response to emergency and communication blackout. The objective of the concept is to apply the COP created by combined geospatial and serious game for modelling military in-field operations during an incident of lacking communications.

The paper explains the project initiated in the Defence Technology Institute that covers the plan to implement the integration of communications, military simulation and training, and unmanned vehicle technologies for the emerging situation awareness to be viewed from the COP. It will house current data and information of rescuer positions, images and live videos. In the commissioned vehicle, a dedicated map server is to host in-coming disparate data that has gone through digital image and video processing. For the COP display, Game Engine will play as a theatre that all data interacts in a common and easy-to-understand view.

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Peer-review under responsibility of the scientific committee of the 7th International Conference on Building Resilience.

Keywords: common operation picture; communication blackout; military simulation and training; situation awareness; C\textsuperscript{4}ISR

\footnote{Channan Kumsap, PhD. Tel.: +66 (0) 2980 6688 Ext. 2424; fax: +66 (0) 2980 6688 Ext. 1300. \textit{E-mail address:} chamnan.k@dti.or.th}
1. Introduction

1.1. Integration of technologies for disaster preparedness and response

Flooding causes damages to property, people, and the environment. The integration of spatial planning with flood-risk management has gained prominence as an approach to mitigating the risks of flooding but been impeded by the absence of easy access to integrated and high-quality information, and the technologies and tools to use information. To facilitate integration and in accord with these three dimensions, a Spatially Integrated Policy Infrastructure (SIPI) was conceptualized for an integrated spatial planning with flood-risk management should encompass three elements: (1) data and information, (2) decision support and scientific analysis tools, and (3) access tools and protocols.

However, it was explored that, by the level of disaster preparedness of private social services in Finland by receiving and assessing feedback from questionnaires, the disaster vulnerable were those who needed to depend on others [5]. In addition, not every private institutional care and sheltered housing services considered disaster preparedness essential, taken into account how private sectors depends on social media for communications. The disaster preparedness and response during emergency should be deemed significant to the general population and public to avoid complete communication blackout. That leaves room for self – established multi-communication grid within defence and security sectors to step in to quickly respond to the emergency and communication management and to seamlessly integrate relevant technologies for timely response. Care should be taken to rely on social media for the communications during times of emergency since Dahlberg [6] pointed out the fact that people who like each other tend to communicate more and have their own circle of trust. Therefore, in real-life disaster/emergency situations people with similarities in backgrounds or lifestyles coordinate better and become the core of social network communication even though by means of informal coordination. Essentially, that mentioned psychological manners because of social network discrimination could suggest how to assimilate the real-life situations to enhance the seamless situation awareness taken into consideration how human behaviours react and coordinate to each other during disaster/emergency.

1.2. Common operation picture in military's situation awareness

The Common Operation Picture (COP) is the core situational awareness (SA) capability for effective decision making, rapid staff actions, and appropriate mission execution. It forms part of C4ISR. COP in this context is meant to merge data from rescue team, UAV surveillance systems to provide informational superiority and enhanced situational awareness. Stone reports in [8] that the US Navy has taken a step forward in deploying a new mine-detection sensor platform to deliver rapid wide-area situational awareness of mine threats in sea lanes and areas of operations. Security considerations have enhanced the importance of dismounted ISR which can be provided by Unmanned Aerial Vehicles (UAVs) or satellites [9]. A fixed infrastructure for the ability of deployed troops to tap into the SA is a key capability, which can be fed to an observer to provide the COP. While the operational environments for the troops are changing, the need for intelligence has always been the key to mission success. That corresponds to the current conceptualization that focuses on the situation awareness that could be trained by the improved situation awareness for better decision-making.

1.3. Military mission in disaster preparedness and response

During the past years, Thailand’s MoD has sent forces to support HADR missions under the framework of United Nations and ASEAN Community, as well as operated a number of missions in sending relief assistance to disaster-affected foreign countries. The development command units located across the country are front-liners according to the 2015 National Disaster Prevention and Mitigation Plan. This line of engagement corresponds to the MoD to deal with protecting and solving problems of disaster and providing humanitarian assistance. Modelling and simulation are planned to be a tool for disaster forecast. Standard Operating Procedures (SOP) of best practices from actual and frequent experiences are input for the method development and incorporation with Thai own SOPs in response to the eruption.
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