Improving information sharing in major incidents using mobile devices and Novel infrastructure

In major incidents information and communications technology (ICT) interoperability between blue light services is critical to achieving a coordinated and effective response. It is also important for this interoperability to be achieved quickly and effectively.

Prototype software development approach that provides the same software capability across different mobile devices. **(Photo: Dstl)**

First responders to major incidents can include a wide variety of organisations that bring different information management practices, policies and information sharing requirements. In some instances these practices may require considerable adjustment and liaison to work collectively. ICT, if used correctly, can play a significant role in addressing the information sharing challenge.

Improvements to first responder ICT interoperability are currently ongoing with significant progress being made across Government. The National Resilience Extranet (NRE), for example, is a project sponsored by the Cabinet Office Civil Contingencies Secretariat, providing a means to share information across the first responder community to help prepare for emergency response.

Project RADIANCE

Through Project RADIANCE, the Defence Science & Technology Laboratory (Dstl), which is part of the Ministry of Defence, has been supporting the National Policing Improvement Agency (NPIA) and the Cabinet Office in research into new technologies to improve first responder ICT interoperability and resilience for in-service deployment in 2015. Project RADIANCE consists of a series of year-long research initiatives focused on three areas: core information infrastructure, resilient communication networks, and future mobile device technology. These technology areas are interrelated and applicable to all types of first responder, be they mobile or at a fixed location.

The first strand focuses on understanding the current approach to information sharing across the blue light services and identifying areas that can be improved. Information sharing is fundamental to a collaborative response, but it can be challenging to achieve. Complexities include silos of localised information, incompatible information transfer standards between organisations, and the need to share information efficiently and appropriately. Our findings show the types of information exchanged are numerous and complex.

Alongside advice on ways information sharing can be improved, we have undertaken research that can help manage information once shared. We have demonstrated core information infrastructure that can present situational awareness information in different ways depending on the organisation concerned.

Available technologies

Our second area of interest is in determining what communications technologies can be used to enhance first response and improve the overall resilience of the communication network. Demand for new capabilities such as full motion video, live mapping, high resolution imagery, and audio streaming are growing, and this has a knock-on requirement in terms of communications technology. Standards-based mesh networking technology provides self-forming wireless networks with higher levels of bandwidth and adaptive routing characteristics that do not require existing civil communications infrastructure, making them

adaptable and hence more resilient. Commercial developments in industry are very relevant, and we have identified a number of suppliers who have relatively mature solutions that can achieve this capability.

Use of mobile devices

Our final area of research focuses on future mobile devices and anticipating how they can be best used to enhance effectiveness for any first responder, but primarily focused at the mobile first responder level. Our findings have shown that while first responders may have access to advanced technologies such as smart phones, some advanced capabilities (such as video creation) sometimes remain under utilised and access to such technology may be sporadic.

Commercial Off The Shelf (COTS) smart phones and similar devices provide an opportunity to capitalise on huge capability advances in display screens, interfaces and processing speeds being made within the consumer markets. Working with Durham University, Department of Computer Science, our research has provided an insight into techniques for designing user interfaces suitable for an operator working under stressful, life-threatening circumstances. Mobile devices evolve quickly due to market pressures, and software platforms seldom remain static creating software development, deployment and maintenance concerns. The research team has demonstrated cross-compilation and web application prototypes and how it could help deliver a more cost effective approach to software procurement. The indications are that COTS mobile devices could be deployed cost-effectively, provided risks are managed.

A great deal of technology is now emerging that can assist first response in major incidents. Through the careful combination of technologies and research, there is a great deal of innovation now possible to improve first responder ICT interoperability and deliver effective information sharing.

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