Delivering and implementing Information and Communications Technologies in the Fire and Rescue Services across England.

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Key findings

1. **The condition of FRS ICT infrastructure differs greatly across England with a number of services facing significant ICT challenges.**
2. **The governance of FRSs has a significant influence on their capability to engage with, or implement, complex and large-scale ICT projects while maintaining existing systems.**
3. **The fluidity and diversity of collaborative relationships between FRS is leading to inefficiencies and will inevitably lead to less effective use of resource. This negatively influences the delivery of a national programme for ICT or national infrastructure.**
4. **Lack of clarity about ESN is restricting innovation by suppliers and increasing costs for FRSs, leading to inertia and inability to plan.**

Background

The UK's Emergency Services (Fire and Rescue; Police; Ambulance Services; other first responders) currently use the dedicated Airwave system to share critical communication. In 2012, the Home Office set up the Emergency Services Mobile Communications Programme (ESMCP) to review and advise on the future Information and Communications Technology (ICT) requirements of the UK's Emergency Services. After sector-wide consultations[1,2], the Home Office opted to replace the 'reliable but limited and ageing'[3] Airwave system with a single technology platform called the Emergency Services Network (ESN) using existing commercial 4G networks[4].

About the Emergency Services Network

ESN aims to provide a new, single platform for voice, imagery and data communication and 'better use of mobile data than Airwave'[4]. ESN was due to go live by December 2019. However, in September 2018, the Home Office revised this schedule to incorporate a phased introduction of ESN: the new date for switching from Airwave to ESN is now December 2022[4]. The delay was attributed to issues around planning, technical standards, user systems and software[5].

The delay presents serious concerns against the backdrop of critical incidents at Grenfell Tower, Manchester and London Bridge where rapid and reliable information sharing were raised as concerns in the reviews of the emergency service response. Whilst emergencies such as these bring the work of emergency services to the public's attention, much of the emergency services' work – including Fire and Rescue Services (FRSs) – is focused on prevention and protection. ESN provides emergency services with the opportunity to be more informed and co-ordinated during response, prevention and protection activities.

About this research

In addition to the change in ICT infrastructure, FRSs are facing cuts in funding[6] with a rapid erosion in back-office and ICT staff. Within this complex and changing landscape, it's important therefore to understand the factors that influence ESN's effectiveness, as well as the implications that the ESN transition has for the FRSs.

We surveyed 40 FRSs and interviewed 22 FRS staff (IT managers; operational officers with responsibility for ICT; ICT and business change programme leaders) about: 1) the current and future state of technology in the FRS; 2) governance structures in the FRS; 3) ICT capacity in the FRS; 4) FRSs' understanding of ESN; and 5) their motivations for and concerns about engaging with the ESMCP.

Our research concluded that existing governance models, ICT collaboration and FRSs' capabilities are stopping FRSs in England from engaging with the ESMCP rollout and transitioning to ESN. This is due to 1) FRSs working under different governance structures and changing strategic alliances across England; and 2) poor resourcing of back-office and ICT functions.

This brief summarises our findings and makes recommendations to make ESN rollout more effective.

 **Detailed findings**  **Recommended changes to ESN rollout**

1. The current and future state of technology in the FRS

The condition of FRS ICT infrastructure differs greatly across England with a number of services facing significant ICT challenges. Only two technologies were viewed as being up to date by over 90% of FRSs: Automatic Vehicle Location and Automatic Call Distribution. Over 75% of FRSs believed three areas are facing significant change: Data Capture, Image Management Software, Person Mounted Cameras.

Given the differing ICT infrastructure across all FRSs, any support to FRSs needs assessing on a service-by-service basis. Any needs assessment should include identifying common priorities across FRSs where co-ordinated activities would be helpful.

Many FRSs are using and will continue to use commercial suppliers to provide data services to FRS appliances. Some staff are often using untested and insecure commercial applications to communicate for work, e.g. Instant Messaging Service/WhatsApp (76%), Skype/Facetime (50%), Google Docs (38%), Twitter (36%), and Dropbox (31%).

ESMCP should clarify the use of non-NATS tested applications and the use of commercial suppliers for mobile data services.

2. Governance structures in the FRS

The Policing and Crime Act 2017 places a statutory duty on fire and rescue authorities, police forces, and ambulance trusts to collaborate where it does not endanger public safety and improves efficiency or effectiveness. Fluid and diverse strategic alliances and collaborative relationships in development and delivery of ICT are leading to inefficiencies and will inevitably lead to less effective resource use. This is negatively influencing ESMCP delivery.

Greater clarity and guidance are needed on best practice and the underlying infrastructure needed to deliver the ESMCP jointly.

The governance of FRSs has a significant influence on their capability to engage with, or implement, complex and large-scale ICT projects while maintaining existing systems. FRSs that are part of a county or smaller unitary FRS currently lack the necessary resource, capacity and capability to fully engage with ESN products. The lack of skilled ICT staff in particular compromises the FRSs' capacity to change and engage with ESN rollout. Although some FRSs do have the capacity and skills to engage with ESN, this capacity is not consistent across England.

As multiple governance structures and variable levels of capability and capacity are significant barriers to system-wide change, there should be additional resources for county or smaller unitary FRSs to get the necessary technical support for delivering ICT infrastructure projects like ESN.

Resources to support ESN and manage Airwave contracts in parallel with ESN has proved very problematic to justify and resource for smaller FRSs.

ESMCP should provide transitionary financial support to smaller FRSs and clarify the funding model, particularly for parallel use of Airwave and ESN devices.

3. ICT capacity in the FRS

FRSs' preparedness and capacity to engage with ESN is not based on geographical location. Key infrastructures may be shared across regional boundaries for ESN. Regional rollout may also not be an effective approach if FRSs are in the process of, or have just concluded renegotiating collaborative agreements, abandoned existing agreements, or created new agreements for delivering core IT infrastructure.

ESMCP should reconsider the composition of regional rollout based on an assessment of individual FRSs' preparedness for ESN.

NATS testing is a significant barrier to innovation and transitioning existing applications onto ESN. Although 22% of FRSs had a high reliance on Cloud Software, 60% of FRSs view the use of Cloud Software as a high priority.

ESMCP should simplify the process for assessing which applications to use on mobile devices are NATS tested, reduce the cost of NATS testing, and develop a central repository of NATS tested applications.

4. FRSs' understanding of ESN

FRSs were very sceptical about the benefits of ESN products to the FRS. The benefits of and motivation to engage with, ESN products, was seen as being, at best, ambiguous. 67% of FRSs expected to see significant change in communicating with partners through data (e.g. Police; Public Health). The case for sharing data over ESN was unclear to many respondents; FRSs do not know how communication with partners through data will change with ESN. Many felt that the commercial networks offered the same capability as ESN Connect. The fire appliance as the nodal point for data connectivity was viewed as important. FRSs noted the low condition for IP Communications; as ESN is an IP based system, there is a low expectation that IP Communications will change with ESN. FRSs did not recognise the advanced potential capabilities of ESN for Call Handling.

ESMCP should develop and circulate detailed Use Cases to describe the benefits of using the range of ESN products; articulate how ESN can enable or provide support for 112 Total Conversation and NG112 and related services.

Lack of clarity about ESN is restricting innovation by suppliers and increasing costs for FRSs, leading to inertia and inability to plan. However, FRSs said they would continue to develop and deploy services using commercial suppliers on the assumption that FRSs could easily transition to using ESN when it becomes available.

As ESMCP has overall responsibility for providing coverage, including all contractual and procurement decision-making, they should produce detailed guidance and standards for FRSs and commercial suppliers to allow them to independently judge compliance with existing services, systems and technology with ESN.

5. Their motivations for and concerns about engaging with the ESMCP

Respondents were concerned about voice and network coverage in rural areas and with in-building coverage. While ESN Assure will help FRSs measure and report on ESN coverage[7], it does not resolve issues related to the cost (how will coverage be paid for; who pays for it) and the speed with which this can be resolved. Cost influences uptake of all ESN products, including ESN Direct, yet there was ambiguity about the potential costs of ESN for FRSs.

ESMCP should provide clarity about 1) the costs and delivery of additional network coverage in rural areas and for in-building coverage; 2) the device cost, network contract costs, obsolescence of devices and refresh cycles, ability to cache data on devices rather than transmit over ESN; and 3) the costs and funding for delivering parallel Airwave and ESN contracts.

As ESN has been delayed until Dec 2022[8], FRSs felt they would be tied into devices and a network that would be superseded and rapidly become obsolete. Many FRSs are already using 4G networks and using devices with greater capability than the ESN Direct device.

ESMCP should provide clarity about an upgrade path for existing devices, and a planning process for transitioning to 5G and Next-Generation networks.

To address the disparities in governance, we recommend that the Home Office review existing FRS governance structures across England.

To address the ICT infrastructure, capability and capacity challenges, we recommend that FRSs receive further investment in skills and infrastructure to fully engage with the opportunities ESN and Next-Generation networks offer.

Briefing source: Allen, D.K., Pugh, D. (2019) ICT in Fire and Rescue Services in England. University of Leeds, UK.

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