



Putting first responders first

★ In the first part of our feature on the ESCRITOIRE 2 project, we ask **Dr Mark Ashdown** and **Prof Chris Firth** of Thales Research and Technology (UK) about the motivation behind their work in linking desktop applications with handheld devices and how it will improve emergency response

Projects: What prompted the original development of the project?

Chris Firth: The ESCRITOIRE 2 project is actually a continuation of some work that Mark did for his PhD while at Cambridge, which we at Thales Research and Technology (UK) supported. We had to choose a focus for Mark's work for the purpose of defining this project, but really it's relevant to any domain that requires communication between large, desktop-type applications and smaller handheld devices; its application needn't be limited solely to emergency response.

Mark Ashdown: It was important to give the project a clear direction so that we had a usage scenario to design for, and to provide a practical context in which we can test our technology once it has been developed. For this reason we chose emergency response, analysed the types of tasks that are performed in that domain, and designed a system to support them.

P: What are the main failings of existing emergency response techniques? Is it that people in the field are unable to give their input and tactical insights?

MA: At the moment personnel speak to each other over the radio but have no way of sharing visual information. I went to a search and rescue exercise in the UK last year, where emergency response teams from the UK and various other countries came together to practise what they would do if they were faced with a major natural disaster or terrorist incident.

It was very interesting to see how they work; they send teams out into the field and speak to them by radio, but have no way of sharing maps and photos, except by bringing them back to the base. We're trying to provide extra visual communication on top of existing voice channels, which is particularly important when people on the ground don't have precise information.

P: And this allows people on the ground to respond to circumstances as they evolve rather than following a rigid, pre-determined approach?

CF: If you're talking about naturally occurring situations – earthquakes for example – then the original map might not be very accurate because it's quite possible that a particular building or street might have been destroyed. In these kinds of circumstances you need to

be able to generate a real-time picture of the actual situation.

P: Did your project try to define the primary role of tactical and operational personnel and then reflect this in the technology you provide?

MA: In the UK, emergency response operational personnel are out in the field; in a search and rescue situation they would be out searching with dogs and cameras, and using heavy equipment to rescue people. Tactical personnel have a mobile command unit – effectively a truck holding several computers – and they hopefully have an Internet connection and can log data. That's really been my model of the operational and tactical roles.

P: Are you trying to give everybody the opportunity and ability to connect to the mobile command unit? Or is it targeted more at a single member of the operational team?

CF: Not exactly everybody. Operational personnel are usually very busy searching, and the last thing they want to do is fiddle around with PDAs. A group like that typically has a commander, who reports back to the people in the trucks, it



Dr Mark Ashdown & Prof Chris Firth

is that individual who we aim to connect to the mobile command unit. Then the trucks themselves – of which there may be several – would report back to the overall strategic centre.

MA: The actual scale of the emergency is not a key concern in our work. If there is a large-scale incident then you could have multiple mobile command units, and they would all need to talk back to a regional centre. In these kinds

then it is split into two groups and a new level is added to the hierarchy.

P: Do people further up the hierarchy typically require more sophisticated technologies than their subordinates?

CF: I wouldn't put it quite like that. At the top of the tree you have the large desktop display, whereas the operatives in the field have the small handheld displays.

CF: The number of pixels you would ideally have per square inch is broadly the same, despite the different dimensions of tabletop and handheld displays. At the moment you can pick up iPhones and other similar devices with these quite high-resolution displays quite easily, but by contrast it is quite difficult to get a tabletop display with that same high-density resolution. Mark's actually using some work from another PhD project we supported at Cambridge which looked specifically at generating this high-resolution tabletop display.

P: Are there quite a wide range of potential applications for this work? If so then would the technology have to be adapted to suit each one, or is it sufficiently flexible to meet a wide range of demands?

MA: The focus is fairly general, so in the current system we have sharing of maps, timelines and reports. You'd have to modify that a bit for each individual application – such as taxi dispatch, fire services and the police – but in general the ability to share a map, annotate it and point things out ought to prove very useful.

We also have various workspace awareness features that can be added to the map so that you can point, gesture and annotate. Those things would hopefully be added to other types of shared data, but yes, you'd have to come up with other workspaces for other applications. ★

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of cases you have more tabletops and more handhelds.

In the fire service they use a quasi-military command hierarchy; in particular there's a management concept called the Incident Command System (ICS), which is considered the best practice for command structures in these kinds of organisations. There are various rules: there's a defined fan-out of 3-7, so each person has 3-7 subordinates, and if you have more than seven people under your command

MA: People in the field don't have the time or attention to spend a lot of time on the computer, so it's probably true that the people higher up the hierarchy will be using more complex software packages, because they're working with computers all the time rather than doing physical tasks.

P: What are the main technical differences between the tabletop displays and handheld devices? Does the difference in dimensions cause any problems?