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Point of View

Interoperability: Enabling public-safety agencies to achieve high performance

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Drawing on lessons learned from the successful OPSCAN project to point the way forward for interoperability in public-safety and other sectors

By Shahid Ahmed and Rob Casselman

One of the greatest tests for any government is crafting an effective, coordinated response to emergencies. With lives often at stake, effective emergency response requires multiple government and non-government agencies working together in a coordinated, collaborative environment. That makes achieving interoperability between their communication systems vital. The variety of personnel and communications equipment involved makes a high performance solution mandatory and yet, an extremely difficult goal to achieve.

Because of the high stakes and multiple parties involved, public safety agencies have sought out innovative ways to solve the problem of interoperability. These innovative approaches have excellent applicability to other industries as well such as utilities, education, transportation, resources and hospitality and event management where emergency response may be required from time to time.

When an emergency occurs, the responding agencies need to quickly establish communication to ensure a coordinated response to minimize the loss of life and property. In the United States, for example, the September 11 attacks and Hurricane Katrina proved to be object lessons in the need for rapid inter-agency communication.

This challenge has frequently been viewed as a purely technical one—how to overcome the fact that agencies purchase proprietary communications systems to best fit their organizational needs without regard to compatibility with external agency systems. Indeed, various efforts are underway in many parts of the world to create standards to which public-safety agencies must adhere. Project 25 (P25) in the United States and TETRA in the European Union¹ are examples of this approach. Accenture was fortunate to be able to spend time interacting with some of the leaders of the successful OPSCAN (Olympic Public Safety Communications Alliance Network) project in Washington State's Clallam County (see box). Based on those conversations and other experience in the public-safety and communications areas, Accenture is convinced that the challenge goes beyond technology. The task of providing a workable, affordable and flexible interoperability solution is truly multidimensional. Technology, to be sure, plays an important enabling role, but it is only a part.

Through our extensive research, including discussions with OPSCAN's leaders, Accenture has gained a clearer understanding of the nature of the challenges facing interoperability as well as some of the practical ways to overcome them.

¹ Project 25 (P25) or APCO-25 is a suite of standards for digital radio communications for use by federal, state/province and local public safety agencies in North America to enable them to communicate with other agencies and mutual aid response teams using a common technology platform. Terrestrial Trunked Radio or TETRA is a comparable set of standards that is primarily used in Europe. As of this writing, TETRA is far more widely deployed in Europe than P25 is in North America.

Technology

Many people first approach the problem of interoperability through the challenges posed by a fragmented infrastructure environment. Public-safety agencies in the United States have traditionally made individual choices about what information and communication technologies they should use, and the same is generally true around the globe. Many of these individual solutions are based on radio, which has a loyal user base because of its reliability—but making communication possible between individual radio solutions during an emergency is very hard to achieve. A common approach has been to create new platforms (for example, P25 and TETRA) that would necessitate wholesale replacement of existing systems. Existing communications systems represent a considerable investment and have been fine tuned and customized over the years to support the daily operations of the concerned agency. It is only in an emergency situation requiring the specialized skills from multiple agencies that limitations to interoperability become evident.

This challenge was very much in the minds of the OPSCAN team, and its approach was to leave the existing systems in place, simply providing a layer of integration to allow inter-system communication.

This choice eliminated a completely hardware based solution that would require a rip and replace of all radio equipment. The remaining two options were a hybrid hardware/software approach where specialized gateways and/or protocols are used to transport voice, or a strictly software based solution where most gateways are supported and deployments are customizable. The OPSCAN project chose the latter; WAVE, from Twisted Pair Solutions. This solution essentially created a "system-of-systems" that, far from imposing new technology on individual agencies, actually expanded each system's range and usefulness during an emergency. Accenture believes that OPSCAN's strategy holds a very important lesson for agencies looking to create interoperability: it is better to see interoperability as a way to interconnect existing systems than attempting to create a single radio system. This practical approach is not only considerably cheaper to implement, it is also much quicker both in terms of technology implementation and getting buy in from the agencies involved.

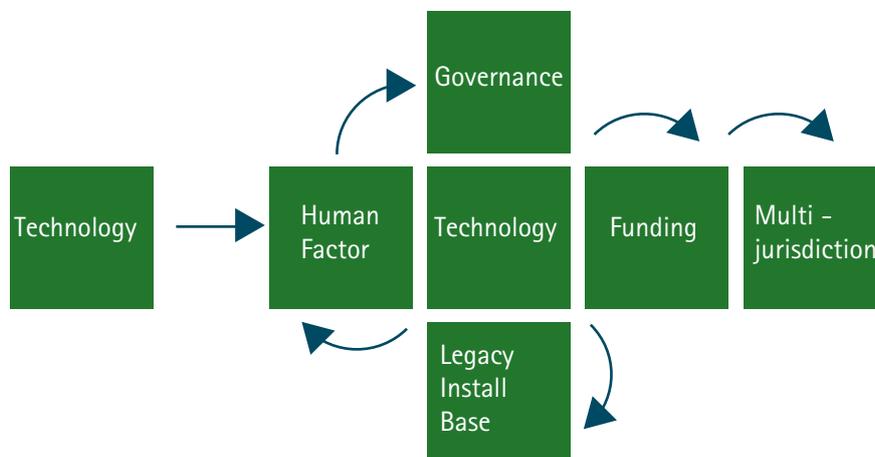
Another important lesson from OPSCAN is that the technology must address operability—that is, the ability of the systems to reach all locations—before it can adequately

enable interoperability. In other words, the systems together may not cover the entire geographic area adequately—or one agency's system may be the only way to access a particular area. Operability issues must first be resolved and ought to be addressed as part of any solution for interoperability.

Culture

The central lesson of OPSCAN is that the technology must be seen within the broader context of creating a common framework for communication across agencies, and putting the processes in place to use it effectively. Patti Morris, grant administrator for OPSCAN, sums it up like this: "This is not just another project, it's about creating lifelong relationships at the personal level as well as durable relationships between agencies. The technology is the easy part!" An integrator, as a trusted third party, can act as a facilitator of this important part of the process, helping disparate agencies to build lasting, mutually beneficial relationships. The relationships forged during the planning and implementation phase will create the synergy that will drive ongoing enhancements to the system into the future.

Technology "Cube" diagram



- Technology – Proprietary vendor LMR technologies are incompatible with one another. Spectrum is fragmented.
- Funding – Limited funding to replace or update expensive communication systems. 'Rip and replace' is not practical.
- Governance – Emergency Management Processes across multiple organizations, ad-hoc, and difficult to operationalize.
- Human Factor – Fit for purpose interfaces. LMR culture and change management issues need to be balanced.
- Multi-jurisdictional – Autonomous, silo-based decision making, planning, and technology expenditures.
- Legacy Install Base – Large investment in current systems and processes; vendor/product driven solutions.

OPSCAN—successful interoperability in Washington State

The Olympic Public Safety Communications Alliance Network, or OPSCAN, is an initiative of Clallam County on Washington State's remote Olympic Peninsula. It was created to unify the communications of more than 40 international, federal, local, tribal and commercial agencies all on disparate methods of communication. From landlines to cell phones to radios operating on a variety of frequencies, Twisted Pair's WAVE technology served as the unifying platform to create a system-of-systems network. The real reason for the project's success was the deliberate and methodical process followed to draw all the parties into agreement, and subsequently create a detailed solution blueprint. Now, as a result of the project, from daily operations to emergency situations, all relevant agencies can be quickly connected and the best possible response coordinated. Due in part to the success of OPSCAN, Internet Protocol-based software solutions have become a key component of the US Department of Homeland Security's grant funding rules for the \$1 billion appropriated for supporting states in their pursuit of interoperability. The State of Washington continues to build upon the success of OPSCAN and has used it as a blueprint for the On-Scene Command Control Radio (OSCCR) project, an independent Radio over IP network linking 13 radio sites from across the state to emergency response organizations. With the flexibility inherent in each solution, OSCCR can easily be tied into the OPSCAN network.

Morris is clear that building a community among agencies is a long drawn out process—but it is one that should not be skipped: "Take the time to understand what each agency wants to achieve, and make sure they get at least some of the desired benefits. And then, when you have agreement, put it into a memorandum of understanding." Many agencies have concerns about opening their channels of communication to outside agencies, and dealing with these concerns is vital.

It is crucial that the culture changes referred to above are embodied in the processes and structures that are put in place to define the roles and responsibilities of each participant. This step is critical to ensuring that the future policy development, planning and operations of the joint venture are handled correctly. Furthermore, it is important to make sure that the lead agency has jurisdiction over the geographical area to give it a real incentive to

press for interoperability, and the stature to assume a leadership role. In the case of OPSCAN, for example, Clallam County proved to be the ideal leader of the project in terms of the influence it wielded, and the need it felt to get interoperability implemented. The lead agency also faces the task of maintaining project momentum over the time it takes to get all the agencies on board—three years in the case of OPSCAN, although it must be added that this is a very short time frame to get an initiative like this up and running. It is estimated that a typical Project 25 implementation of the same complexity would take approximately 10 years from concept to deployment completion.

Funding

The question of funding is particularly delicate in multiagency projects such as we are describing. Each of the participating agencies will have its own budgets and source of funds. "It's very important

to be aware of the source of agency funding," according to Bob Schwent, Division Commander for the Washington State Patrol. Funds may come with restrictions for how it is used. For example, "State Transportation dollars must be used for Transportation projects." Stipulations such as these can make partnering and collaboration for this type of project difficult. Equally important is the fact that some agencies simply will not have budget allocated for this sort of project, so the project's funding model must be flexible. For example, the sheriff's department found itself without funds to contribute to OPSCAN—but with plenty of skills. "We were able to pay our way by contributing our labor and expertise in radio," says Don Miller, telecom manager, Washington State Emergency Management Division. In fact, Miller and his team's technical know-how and strategic insight were a major contribution to OPSCAN's success.

Discussion around funding needs to be comprehensive right at the beginning of an interoperability project. Unified interoperable communications uses a variety of software and hardware components as well as Radio over Internet Protocol (RoIP), all of which need ongoing maintenance and support. Agencies need to budget for operational as well as capital expenses. "This can be quite a change of mindset," observes Morris. OPSCAN recognized this issue early on and made sure that operational costs were distributed fairly across all the agencies. Integrators can play a key role here in developing a working model of both capital and operational costs for the project.

Because of the difficulties that a capital expenditure might cause for many agencies, we predict that a managed-services approach could be attractive. This would shift all expense into the operational category, something for which many agencies (and businesses too) find easier to budget.

Deployment

In the experience of the OPSCAN team, the roles of the participating agencies and the third-party integrator need to be clearly defined. It is vital to understand just what is needed to implement the system, including skills, network design, technology recommendation, staging, deployment, testing, acceptance and operational support. For the OPSCAN team, getting commitment from some 40 agencies was a mammoth task, but equally important was getting them to switch onto the new network. Morris has this advice: "Make sure the process for network acceptance by each participant is agreed on up front otherwise the project can falter at the last fence." Morris also stresses the benefits of integrating training into the implementation very early on—given the normal human resistance to change, one cannot begin this process soon enough. It is important to create a concrete demonstration of what

the new system can do, so that users can experience the benefits they will receive by switching over to it.

Accenture's experience in helping to operationalize new technologies confirms the wisdom of this approach. Ongoing training not only helps to speed acceptance but also to keep the system in use as new personnel are hired over the years.

Operations

Once the new system is operational and all the agencies have switched over to it, operational effectiveness is dependent on governance policies. These policies must ensure that system maintenance occurs, and new refinements are implemented. In particular, the required support response times for each agency need to be agreed upon, as well as the management of each support function. OPSCAN's approach was for the agency that owned the site to be responsible for the maintenance of any shared infrastructure located at the site. Where new sites were acquired for the project, they were registered in the name of the project with maintenance a joint responsibility.

An important part of ensuring operational effectiveness, in Accenture's view, is the creation of standard operating procedures for emergencies. Typically, the dispatchers responsible for the interoperability platform rely on a physical book of relevant procedures—sometimes called a "red book"—for guidance. However, in an emergency situation, the first few hours are extremely challenging for dispatchers. We advocate automating some of these procedures, thus ensuring that agreed steps are carried out in sequence and that dispatchers can concentrate on other things.

OPSCAN's pioneering work has justly received wide recognition, and has highlighted how the common challenges facing interoperability can be surmounted. But this is only the beginning. Accenture has developed a broad vision for Unified Interoperable Communications that builds on these insights to create an integrated approach that combines technology, people and processes to help government agencies (and others) serve citizens better during an emergency—a situation where high performance can be, quite literally, an issue of life or death.

Accenture's Vision for Unified Interoperable Communications

Accenture has drawn on its decades of experience in helping government agencies and businesses around the world use technology to achieve high performance. Its profound understanding of both business process and technology disciplines, and its research-based understanding of what characteristics underlie high performance in the public sector have served as the foundation for creating a comprehensive vision for Unified Interoperable Communications. Much of Accenture's research and theories have been validated through close study of the OPSCAN project.

Accenture also envisions multiple applications for interoperability in diverse industries in which emergency response is sometimes required. These industries include utilities, education, transportation, energy, and event and hospitality management. Two examples: the US government has "strongly recommended" interoperability between nuclear power generation sites and first responders in the case of nuclear disaster. In the energy

sector, interoperability would enable easier communication between the Coast Guard and oil rig personnel in the case of a fire.

In Accenture's view, to be truly useful and to drive significant value into emergency response, both procedural and technological changes need to be made. Interoperability solutions must incorporate the following elements:

Focus explicitly on the human factor and culture change.

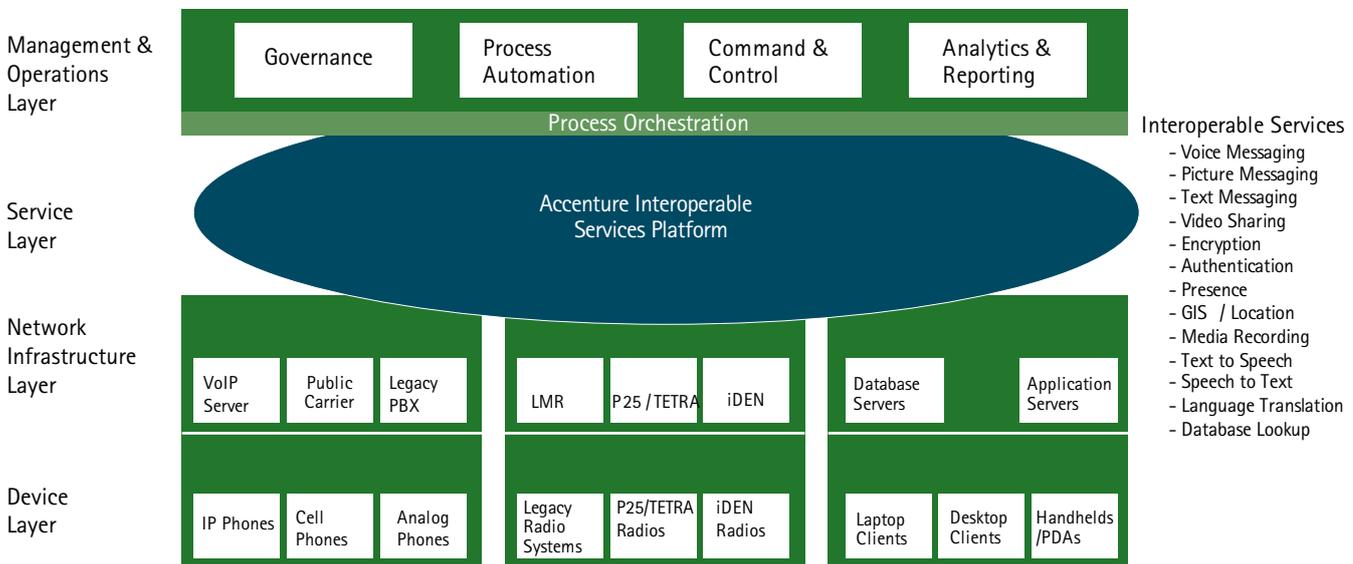
Technology must be seen within the broader context of creating a common framework for communication across agencies or organizations, and putting the processes in place to enable such communication to occur effectively. Regardless of the technology chosen, successful change management will define a successful project. The communications devices may or may not change, but the processes governing how they are used, will. These procedures must be clearly defined and communicated to ensure

that agencies work together how and when required. These aspects of culture and governance must drive the implementation of the technology and not the other way around.

Incorporate capabilities for process automation and advanced analytics.

What can be automated should be—not only to reduce running costs but also to optimize response under pressure. For example, many standard operating processes, such as alerting and notification, can be partially or fully automated depending on the need. Advanced analytics can also be put in place to enable on-the-fly analysis such as detecting the need for additional personnel, as well as more reflective post-event analysis that can be used to facilitate procedural improvements.

Accenture UIC Solution



Seamless integration of new and legacy communication systems.

It is clear by now that creating a single public-safety network is operationally unrealistic and potentially expensive. Accenture's view is pragmatic: we believe Unified Interoperable Communications must enable the seamless integration of both new and legacy radio systems as well as any other networked communication devices that might be in use, such as cell phones, landlines, private exchanges and laptops. In other words, it must create a "system of systems" that expands what is already in place by providing connection between existing systems. The US Federal Communications Commission's National Reliability and Interoperability Council (NRIC) has, in fact, called for an emergency communications system linked in an "inter-network" fashion.

This technology approach has far-reaching ramifications because it means agencies are not forced to scrap existing technology investments, including radio networks. Accenture's approach allows agencies to continue to benefit from existing investments while at the same time allowing for greater flexibility and power when it comes to adding new capabilities such as video or global information systems. This approach also makes Unified Interoperable Communications inherently scalable with respect to both adding new agencies and new value-added services. Because it offers a bridge between networks to create a system-of-systems and most often does not require a technology replacement, Unified Interoperable Communications can potentially avoid the huge price tag of other technologies like P25 or TETRA.

The technology to support this system-of-systems approach is the vital foundation of any interoperability solution, and Accenture works closely with technology vendors that offer this kind of capability. For example, Accenture recognizes Twisted Pair Solutions, which offers the WAVE unified communications platform, as being a leader in

supplying this essential part of the solution to agencies around the world, and notably to OPSCAN.

Support all forms of media and provide an integrated suite of applications and services.

While voice is the primary medium for any multiagency communication, Accenture's vision is that Unified Interoperable Communications must ultimately offer support for data in any form that is useful, including text, pictures and video. Furthermore, the interoperability platform itself must provide more than connectivity alone. Because the technology exists only to enable business processes for responders, it therefore must offer messaging services (voice, picture and text), video sharing, encryption, authentication, location via global positioning satellite, media recording, text-to-speech (and vice versa) functionality, language translation and database lookup. Presence, the service that allows users to see not only who is online but how they wish to be contacted, is particularly important because of the role it plays in enabling effective, real-time collaboration.

As and when these services are rolled out across the network, care must be taken to ensure that they are made available on the existing devices. Of course, given the federated nature of this system, integrating a broad range of specialist areas like these is in itself a complex task requiring business insight, experience in developing governance frameworks, and process modeling and transformation; all core competencies of Accenture.

Summary

Organizations have long recognized the need for information. With the advent of technologies that enable collaboration and coordination, agencies and enterprises are no longer limited to information harbored within their silo of operability. Where once it was acceptable to function as an autonomous organization, recent disastrous events have brought to light the deadly consequences associated with that operating model. Accenture's research, along with examples such as OPSCAN and OSCCR have shown that sharing information across agencies can be made possible, but not without with the right planning, commitment, and skills. As a trusted third party advisor to some of the largest public and private enterprises in the world, Accenture has developed the strategy, methodology, and skills to ensure a smooth transition to interoperable communications.

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