Applied Coursework

Technology for Homeland Security Course Paper

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IS4010 Technology for Homeland Security Case Study
Monterey County, California Next Generation Radio Project
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Introduction and Background

Monterey County, California is currently in the process of completing and releasing a Request for Proposal (RFP) for a next generation data and radio system (NGEN) to replace a legacy system that is outdated and failing. A committee consisting of representatives from every public safety agency, government jurisdiction and executive management group is part of a team working to release the RFP during the first quarter of 2009. The RFP will identify a vendor to design and build the NGEN system. More important than the RFP process is the creation of a governance structure that will set the vision, strategic initiatives and goals for the entire project. This case study will examine how a sound governance structure is critical to manage technology and human interaction that simultaneously support and hinder the NGEN project.

The replacement of the legacy data radio system is driven not only by the goal to replace the failing infrastructure but to also meet narrow banding and interoperability radio requirements. In December 2004, the Federal Communications Commission required that all state and local public safety agencies narrowband all voice and data radio frequencies no later than the year 2013 (National Institute of Justice, 2008). The Monterey County system is not currently narrow banded. Additionally, the Department of Homeland Security (DHS) SAFECOM Communications Program established interoperability requirements that must be met by all public safety agencies in order to qualify for a variety of Federal grant programs (SAFECOM, 2008). The stipulations of narrow banded radio frequency requirements and interoperable communications

guidelines require that public safety agencies invest substantial amounts of money into new radio technologies and to create cooperative, multi-agency agreements to achieve interoperability.

Maintaining the status quo is not an option since failing to meet the Federal mandate to narrowband radio frequencies may result in radio interference with the current broadband radio network. Any broadband system that interferes with narrow banded frequencies will be required to shut down. This alone will result in a complete radio system failure for government organizations that do not narrowband by 2013.

The National Task Force on Interoperability published the document *Interoperability Why We Can't Talk – Working Together to Bridge the Communications Gap To Save Lives - A Guide for Public Officials* correctly states that, "The primary reason public safety radio communication systems are not interoperable today is because agencies within jurisdictions and neighboring jurisdictions have developed radio communication systems independently."(National Task Force on Interoperability, 2003. p.1) The document expands on how to set priorities, identify tasks and leverage leadership to achieve interoperability. Monterey County has the advantage of a central emergency communications center, however, the technology used by individual public safety agencies are not capable of interoperability in their present state.

In January 2006, the professional firm, 911Insight, completed a communications system strategic plan for Monterey County. [1] (911Insght, 2006) The plan includes the following overview of the state of Monterey County emergency communications:

"Monterey County occupies over 3,000 square miles on the central coast of California, having a permanent population of over 400,000 persons. The cities of Carmel,

[1] On overview of this company can be viewed at http://www.911insight.com/index.html.

Del Rey Oaks, Gonzales, Greenfield, King City, Marina, Monterey, Pacific Grove, Salinas, Sand City, Seaside and Soledad are found within the County boundaries. Monterey County operates a unified public safety dispatch center in Salinas supporting almost forty public safety agencies. The public safety agencies use a network of Very High Frequency (VHF) and Ultra High Frequency (UHF) voice radio systems consisting of 49 channels at 36 radio sites (all but one site is within Monterey County). Public works, parks departments and other local government organizations likewise use VHF and UHF radio communications to support their operations. The existing voice radio systems operate using wideband channels. These systems are generally outdated, having been designed in the 1980's and incrementally enhanced over time. Federal Communications Commission (FCC) initiatives require that future changes to these systems incorporate narrow band channels. In addition to the voice radio systems, a mobile data system using 800 Megahertz (MHz) channels is also in place, but is subject to recent FCC re-banding directives and is immediately affected by the "first wave" of transition coordination."(911Insight. 2006. p. 1)

ISSUE: Governance

This snapshot reveals a number of challenges that must be addressed to successfully complete the NGEN project. The SAFECOM Interoperability Continuum identifies five critical elements that include governance, standard operating procedures, technology, training and exercises, and usage. (SAFECOM, 2008) The Monterey County NGEN project must develop goals and objectives outlined in the continuum to successfully complete the project. Governance is the foundational element for this project and is the framework through which participants in interoperability projects can

collaborate, set priorities and resolve conflicts to achieve overall goals. It is also the umbrella that brings varying perspectives of jurisdiction, discipline, organizational cultures and consistency together in an identified region. (SAFECOM, 2008)

It is only after governance is established that the four remaining parts of the continuum can be completed. The 911Insight report recommended a governance structure the combine elements of a lead organizational structure and regional organizational alternatives (911Inight, 2006). This proposal reflects the current structure for the Monterey County data radio system. The lead organizational structure is a county communications center that provides a dispatch and communication services. The regional organizational governing body (Emergency Communications Users Advisory Council - ECUAC) provides policy oversight through a joint powers agreement between the user agencies.

The governance structure for the NGEN project must change for a number of reasons. The NGEN system must be able to accommodate users that request access only to the data system but not the radio system. Currently all users are part of the radio network and existing joint powers agreement is not designed for data only users. Additionally, the County of Monterey is the sole owner of the infrastructure and is solely responsible for the cost of maintaining the equipment without compensation from other user agencies. This will change as the NGEN project moves forward and costs will now be shared by all users. Achieving interoperability may be considerably less expensive for public safety groups rather than individual agencies attempting to build their own. Pursuing independent systems may result in the acquisition of a variety of hardware and software solutions that may not be interoperable.

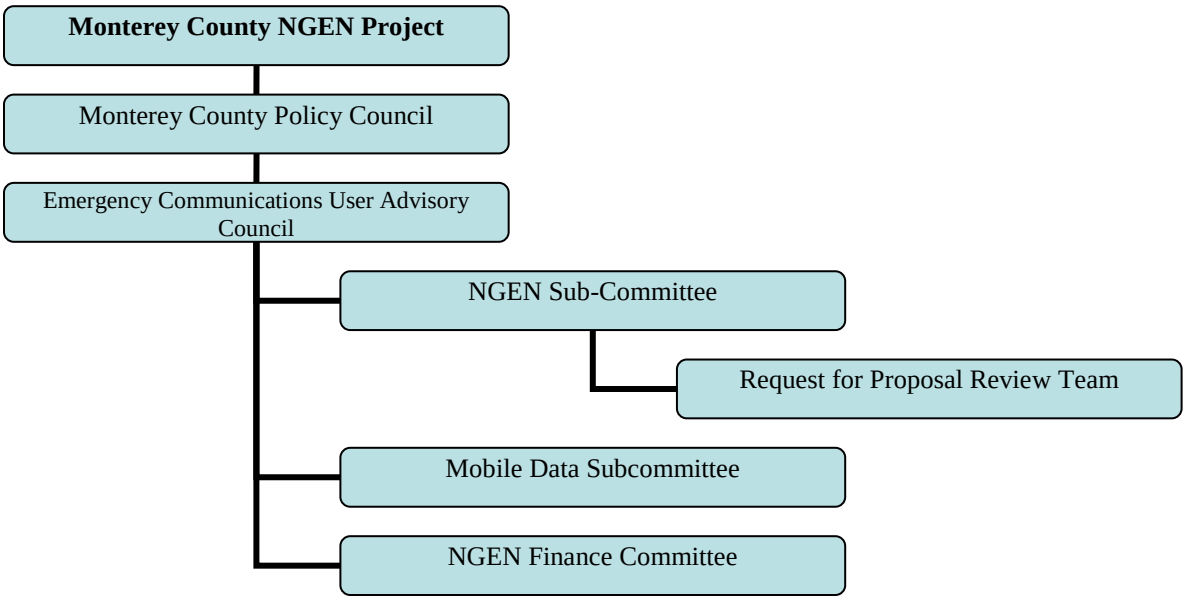
There are specific project areas that will not be accomplished without a common governance structure. The NGEN project requires cities, special districts and legislative government bodies to agree on a finance plan before any other part of the project can proceed. NGEN requires that each of the forty public safety agencies that are part of the regional 911 Communications Center to develop and adopt standard operating procedures, training and use plans for the new technology. There are different radio frequency technologies currently in use by different public safety agencies that require standardization. (911Insight, 2006) Shared governance is the critical element of this technology project. The failure to establish shared governance will undermine any effort toward interoperability since there will be no anchor point to sustain changes over the long term.

Developing a governance solution is the significant challenge for this project. Participating members of this group must answer the question of who owns the infrastructure, who decides the functionality of a new radio system and how is it maintained and managed into the future. Communication needs are different for public works, police and fire disciplines and require the design of new radio systems that meets the needs of each group. The governance agreement must be able to bring a variety of public service disciplines together that complete for scarce resources of time, management capacity and finances.

Governance + Social Complexity = Wicked Problems

Creating a successful governance structure for the NGEN project requires an understanding how human relationships influence planning, implementation and long term project success. Interoperable projects are much more than the technology that

drives them. The success of these projects includes building associations with project members that are both task oriented and emotionally based. The blending of these relational elements can be characterized as social complexity. Social complexity is a term that can be defined as a team or network of individual stakeholders, sub-committees, organizations, and departments that are linked by a single project. (Conklin, 2008) Consider the organizational chart of stakeholder groups for the NGEN project.



Each committee, council and team is represented by specific agencies and public service disciplines with competing interests and goals. It will be through these organizational structures that a governance structure will emerge for the NGEN project.

Describing the development of a governance structure for interoperability can be defined as a wicked problem. Wicked problems are, “those problems that by their very definition are so tangled that there is no agreement about their definitions, much less their solutions.”(ScienceDaily, 2007, p.1) Dr. Jeff Conklin (2008) in *Wicked Problems and*

Social Complexity states that, “collective intelligence is a natural property of socially shared cognition, a natural enabler of collaboration. But there are also natural forces that challenge collective intelligence, forces that doom projects and make collaboration difficult or impossible. These are *forces of fragmentation*.”(Conklin, 2008, p.1) Stake holders in any project can be potential inhibitors in the development of the governance structure required for the Monterey County project. Stake holders include, for example, department heads, finance officers, system users, politicians and attorneys. Understanding how social complexity and fragmentation can negatively influence the creation of an interoperable system is not likely to be considered or incorporated into a strategic plan, MOU or Requests for Proposals (RFP).

Fragmentation can occur at any level of participation and at any point in the timeline of any project. The following examples demonstrate fragmentation in the context of the NGEN project.

1) Perception of safety: One design option for the NGEN system is to use digital technology in place of analog technology. A potential problem with digital technology is it is difficult to hear radio transmissions in high noise environments. One member of the fire service attending a meeting of the NGEN Sun-committee become visibly angry expressing his opinion that digital technology would “kill” firefighters making his point by throwing copies of internet articles across a table.

2) Use of current technology: Potential solutions for transmitting data over communications systems include using cellular technology that can carry significantly more information than the current data radio frequencies. A member of a specific law enforcement agency expressed the opinion that the city in question would leave the

project completely if they could not have cellular access to data immediately. This police agency is the second largest user of the existing radio system and could potentially disrupt the project if the agency withdrew.

3) Communication with executive leaders: A small percentage of public safety executives do not read widely distributed meeting minutes, attend informational meetings, review functional specification recommendations or pay attention to time critical tasks. These executives have the positional power to disrupt critical decision points of the NGEN project. These delays are completely avoidable since it is only because of a failure to stay informed and insist on redundant briefings to be brought "up to speed" by executive managers.

4) Project cost: This is perhaps the most significant point of fragmentation for the NGEN project. The current budget crisis in California requires drastic cuts for government at all levels. The City of Monterey, for example, is now facing a $1.6 million dollar budget shortfall for the current fiscal year and an estimated $2.9 million dollar shortfall for the fiscal year ending in June 2010. (City of Monterey, 2008) The reality is that all participants in the NGEN project face similar fiscal challenges. The cost of the NGEN system is estimated to be $26 million dollars. The changing dynamics of the financial picture for California could require significant design changes to the NGEN project.

Each of these examples has the potential to significantly impact the success of the NGEN system from becoming a fully interoperable, data radio system. Perceptions of safety (real or imagined), constantly changing technologies, unmotivated executive leaders and the unstable fiscal landscape are all uncontrollable factors in a project that

includes multiple public safety disciplines, government structures and cultural differences. These potential roadblocks to success can be mitigated through a governance structure that is flexible enough to assess obstacles, design responses and implement solutions in an environment that constantly changing.

Evaluation of the NGEN Project … Today

The SAFECOM Interoperability Continuum is an evaluation tool for public government organizations, "to gain a true picture of a region's interoperability…Optimal interoperability is contingent on an agency's and jurisdiction's needs. The Continuum is designed as a guide for jurisdictions that are pursuing a new interoperability solution, based on changing needs or additional resources."(US Department of Homeland Security, 2008, p.3) Of the five elements of the continuum, governance is identified as the foundation on which stake holders make strategic decisions and achieve shared goals. Success can only be achieved when government organizations at all levels commit to finding a common solution to interoperability. The SAFECOM Governance continuum is referenced below:

The Monterey County NGEN project from a planning perspective is currently at the higher end of the spectrum as collaboration does occur on a regular basis. There are currently two Memorandums of Understanding (MOU) in various stages of review and approval. The first is a Finance MOU for all groups interested in participating in the

NGEN project. The second is a Mobile Data System MOU that will be a bridge agreement as the legacy system is replaced. Each of these documents establishes governance frameworks for specific elements of the NGEN project. Participants in the project completed a functional specification document as a basis for the RFP that will be released in the first quarter of 2009.

These documents are the first governance pieces for the NGEN project and each establishes parameters for how individual agencies will fit into the interoperable system. They establish the baselines for performance and participation. The test of these agreements will occur when human complexity issues weave into the technology, funding, SOP and training aspects of the project. The leadership groups that emerge from these agreements will be required to manage emotions, culture and perceptions against technology, finances and the delivery of public safety service to Monterey County.

Conclusion

The Monterey County NGEN project will not end with the acquisition of the equipment to replace the existing legacy radio system. The governance element of NGEN will transition from developing solutions to facilitating on-going, professional relationships that maintain the long view of managing and leading all Monterey County public safety agencies for interoperable communications. Overall the project is on track and building on the past success of the regional county communications system. The project will result in the creation of an interoperable data and radio system where all public service agencies can respond entity to the public safety needs of the community.

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