



# The Computerworld Honors Program

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## Final Copy of Case Study

**Status:**

Laureate

**Year:**

2013

**Organization Name:**

Tséhootsooí Medical Center DBA Ft. Defiance Indian Hospital Board, Inc.

**Organization URL:**

<http://www.fdihb.org/>

**Project Name:**

Redefining Health Care Through Network Modernization

**Please select the category in which you are submitting your entry:**

Health

**Please provide an overview of the nominated project. Describe the problem it was intended to solve, the technology or approach used, how it was innovative and any technical or other challenges that had to be overcome for successful implementation and adoption. (In 300 words or less.)**

Most of us take for granted access to basic health care services, as our primary care physicians and choice of hospitals are a short distance from home or work. But what if you lived in a very remote area on a vast Indian reservation and the nearest doctor and hospital were hours away? What if most of that distance was traversed by dirt roads? Worse, what if you had no car, there was no form of public transportation and you were elderly or a single parent? These are the situations in which many patients served by the Tséhootsooí Medical Center in the Navajo Nation, which spans more than 27,000 square miles across Utah, Arizona, and New Mexico, find themselves. For most patients in this remote region, access to health care is through visiting public health nurses and community healthcare workers who travel to regional community centers. These centers include senior citizens centers and chapter houses that have little in terms of technology and technical support. TMC wanted to improve the medical capabilities of its hospital and extend services to its remote communities. To do so, TMC had to replace all its legacy equipment and upgrade its LAN/WAN, data center, firewalls, and VPN; set up

wireless, VoIP and video capabilities; implement higher encryption standards required by HIPAA/HITECH; and create a backup site for disaster recovery. The hospital now has 21st century capabilities, and 9 of the 16 chapter sites have or will be connected to the hospital, meaning more patients have greater access to better care, with doctor exams, advanced diagnostics and follow-ups that were previously out of reach. And, the foundation is now in place for the next generation of TMC services, including telemedicine and online access to Electronic Health Records and other services.

**When was this project implemented or last updated? (Please specify month and year.) Has it incorporated new technologies and/or other innovations since its initial deployment? (In 300 words or less.)**

The project was proposed in 2011 and implementation began in September 2012. It is ongoing and constantly updated. Since the initial deployment, which consisted of installing, testing and reconfiguring equipment (from the closet to the server room), changing IP schemes, and rewiring to lay the foundation for subsequent phases, TMC has: Migrated from Indian Health Services domain to an independent Active Directory domain so TMC has complete control over the management of its own LAN and WAN. Upgraded WAN data links from 45MB to 100MB to improve connectivity throughput and quality of service. Improved site-to-site VPN capabilities between the hospital and external medical services providers. Implemented triple DES encryption and wireless encryption for HIPAA compliance. Deployed 600 VoIP phones with video, text and alert capabilities throughout the hospital to improve communications between doctors, nurses and patients and pilot test telemedicine. Provided doctors and nurses with wireless network connectivity to increase access to information via laptops while mobile. Implemented remote desktop services so staff has access to Electronic Health Records and the Resource Patient Management System, which consists of over 50 software applications and network communication components developed with the Indian Health Services. It includes modules for billing, lab, pharmacy, etc. in one shared database structure. Established disaster recovery capabilities with a backup data center at the Nahata Dziil clinic in Sanders, Arizona. Set up fiber interconnections to ensure redundancy at the switch level. Made switch-level improvements that enable greater manageability and security via a network management protocol. Increased backup power capabilities to ensure greater reliability. Implement server and desktop virtualization. Integrate and maintain COT software applications and SQL databases for financial and human resources. Built and maintain internal and external websites for hospital communications and public exposure.

**Is implementation of the project complete? If no, please describe the project's phases and which phase the project is now in. (In 300 words or less.)**

The first phase was planning and preparing for a complete network modernization effort. That first phase included the installation of new equipment from end to end, reconfiguring IP schemes, and cable rewiring throughout the enterprise. The project is currently in the second phase, which includes the main hospital network upgrade, where capabilities and quality of service, reliability, security and redundancy have greatly expanded, and where connections to the chapter houses are to be established. The next phase (in 2013) will include the implementation of additional technologies like full desktop virtualization, to provide staff with greater access to tools while they are at home

or traveling; and the ability of doctors to use devices, such as iPads or tablets, to access patient information at the bedsides through wireless capabilities. As mentioned previously, 9 of the 16 chapter houses have or will soon be connected to the hospital and TMC anticipates that the remaining seven chapter houses will be connected by fall 2014. The final phase will fully define telemedicine. This includes the use of live interactive video for primary care and referral services, and remote patient monitoring and diagnostics, so patients who cannot easily reach the hospital or clinic will have access to physicians and specialists. Point-to-point connectivity will allow online access to medical and health data. Patients and providers can obtain specialized health information for verification and medical decisions. In addition, remote medical education training and seminars will be available for specific groups such as diabetes patients. TMC is extremely proactive with education since this disease has higher than normal national averages on the Navajo reservation. Improvements in data storage capacities will bolster the ability to offer these services to patients. TMC will digitize most of its business data and hospital health records for archiving, reporting, and redundancy.

**Please provide at least one example of how the technology project has benefited a specific individual or organization. Feel free to include personal quotes from individuals who have directly benefited from the work. (In 300 words or less.)**

In 2011, a Tuberculosis outbreak around the small community of Sanders, Arizona, drew a huge concern. For four days in August, state, local, Indian Health Services, and Navajo Nation officials came together to determine who they could identify with TB. It was important for the hospital to get out into the community to conduct screenings rather than wait for people to come into the clinic or hospital. TMC provided remote communications, deployed a mobile x-ray unit, screened approximately 350 people, and streamed the images back to TMC to be interpreted by radiology and other medical specialists. This deployment of technology greatly facilitated and speeded diagnosis of numerous noninfectious patients and the treatment of one infectious patient, who may have otherwise gone undiagnosed until it was too late. While a terrible emergency, the TB outbreak provided an opportunity to test the VPN technology that is currently in use at the NahataDziil Health Center connected to the hospital. In fact, the hospital continues to provide medical services for approximately 7,600 patients annually at its remote clinic. Without a doubt, the technology project has benefitted people in Sanders and surrounding communities significantly as well as the service providers and community health nurse program. In addition, the remote desktop services recently employed enable providers and hospital administrative staff to access EHR, diagnose treatment after hours, and communicate while on travel or at home. This remote desktop capability has proved invaluable during pandemic practice drills, and will be especially important during future emergencies such as the earlier TB outbreak outside the hospital environment, when doctors and administrative staff need to connect to the hospital remotely to remain effective. The capability also serves technical support and management in that the IT department can remotely support hospital staff whether at the hospital, clinic or chapter houses.

**Would this project be considered an innovation, a best practice or other notable advancement that could be adopted by or tailored for other organizations and uses? If yes, please describe that here. (In 300 words or less.)**



The modernization of FDIHB's IT infrastructure to deploy new technologies and the strategies used to extend medical services to the community centers or chapter houses could not only be adopted by other Indian Health Service units, but by any hospital serving remote or rural areas. From the configuration of the network to the routers to the end-point technologies chosen, everything was designed to maximize quality of service while using the limited amount of bandwidth available, a common issue in rural areas. Also, ease of use and the ability to remotely access the technology was critical since much of it is spread over great distances and therefore not easily accessible by TMC staff. TMC providers and the community health nursing program would measure success using technology in these remote areas, i.e., through patient satisfaction surveys, ensuring doctors and nurses treat patients with courtesy and respect and patient communication with nurses and doctors is increased. Telehealth and/or telemedicine in the community also benefits patients and providers by reintroducing the true "patient to doctor" experience which, according to recent public research, has become a missing ingredient in today's healthcare. With an emphasis on computer security, Electronic Health Records availability at all chapter sites will allow providers and public health nurses to quickly access community health information. Records will be available through thin client devices with desktop and application virtualization software. No data will be stored on computing devices at each location. Not only will this protect patient information but it will translate to minimal use or loss of hardware resources. Both logical and physical security has consideration in this configuration. Also, virtual desktop client devices are easy to manage and deploy, have performance with cost savings, and can provide power savings at remote locations with tight budgets.

**If there are any other details that the judges should know about this project, please note them here. (In 300 words or less.)**

For FDIHB, Inc., serving a population of more than 200,000 living in a remote area with an unemployment rate of 48 percent, improving access and quality of health care through technology is more than a goal; it is a mission. FDIHB, Inc.'s efforts to bring 21st century medical services to the Navajo Nation in this region follow in the tradition of public health pioneers like Annie Dodge Wauneka. Wauneka was an influential member of the Navajo Nation Council and one of the first recipients of the Presidential Medal of Freedom, which she received in 1963 for her tireless efforts to improve health standards for the Navajo. Among other things, she traveled around the Navajo Nation as a public health activist and called for the modernization of medical care for generations who had known only traditional medicine. She was also credited with helping to defeat TB and tackling other health issues among the Navajo. Despite the challenges faced by TMC, patients in the region are benefiting from improved access to healthcare. When the organization was still under federal operations, reaching out to the remote chapter facilities was not even attempted. It was not uncommon to hear about someone who hitchhiked several hours to reach the hospital or someone who lives in such a remote area they were essentially unnoticed. That is changing, thanks to TMC's network modernization, which is improving and extending medical services to those who need them most. Dr. Leland Leonard, CEO, TMC, recently stated, "Our desire in using Information Technology is to make an impact in closing the health disparities among the Navajo people in our region."