Connecting the Disconnected: What FSM is doing?

Norleen Oliver, *Systems Administrator, Department of Health & social Affairs. PO Box PS70, Palikir, FM 96941. Federated States of Micronesia. Phone (691) 320-2619-2643 Email: noliver@fsmhealth.fm*
Sepehr Sohrab, *IT Consultant, Hospital Preparedness and Emergency Response Program. PO Box PS 70, Palikir, Pohnpei, FM 96941. Federated States of Micronesia. Phone (691) 320-8300. Email: ssohrab@fsmhealth.fm*

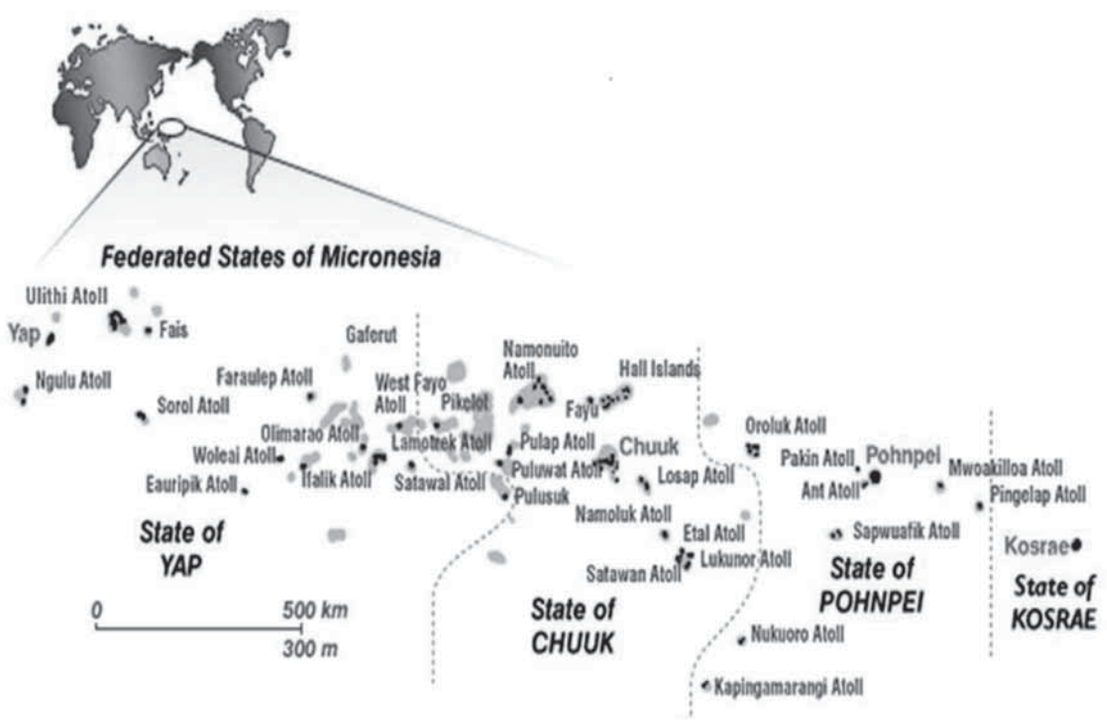
Abstract:

This paper describes the effort the FSM Department of Health and Social Affairs has carried out to connect its geographically disconnected and isolated hospitals and health facilities on the same health information network. It discusses the rationale and the process for such undertaking, lists the achievements the project has made, and lays the vision for its future direction.

Key terms: *Federated States of Micronesia, Stand-Alone PC Database, Local Area Network and Wide Area Network, Registry, Webiz, Fiber Optics*

Map of the Federated States of Micronesia

Courtesy of FSM Visitors Bureau



Introduction

Almost every island country in the Pacific with limited resources and scattered geography faces the challenge of having a centralized health information system for gathering, processing and storage or archival of vital health data. The term "data cemetery" was coined by others to mean that most Pacific Island countries were able to collect information but unable to make any sense from what they collected. Contributing to this predicament was the practice by many island countries including the Federated States of Micronesia (FSM) to operate on stand-alone computers rather than on a network in order to guard against system – wide malfunction.

The FSM is made up of four states (Pohnpei, Chuuk, Kosrae and Yap), spreading over a vast area of the North Pacific. All states except Kosrae have remote outer laying islands/atolls. The FSM has a federalist system of government with the states having a great deal of autonomy.

This structure gives each state the flexibility to assess its own needs and to funnel its resources based on each individual state's priorities. However, there is a need to be able to report, assess and make decisions at a national level, especially in the area of health, because of the crucial role the central government plays in the development of the nation. This need prompted the FSM National Department of Health and Social Affairs (DHSA) to move away from the standalone-computer model and began the implementation of a robust and secure local area network and a wide area network.

The Project – Moving Away from the Usual Stand Alone Database

In 2003, the FSM Department of Health and Social Affairs undertook a project involving an implementation of a robust and secure local area networks and a wide area network, establishing a network grid that connected the National to the four States' hospitals. This provided the staff across these entities with a unified electronic mail system for communication and information sharing tools both within and between each organization. Though connected, they are independent of each other. This means that each state health service has its own control over any network resource it wants to add on to its network whether it be a new user or a computer or a printer. Once added, those resources then become part of the whole network resources that can be accessed and shared between the states. However, when any of the state's connection goes down, it does not affect the others. This was the first time a layout of a wide area network like this was ever put in place in the FSM.

Putting the Pieces Together

In the same year, necessary equipment including PCs and networking devices were purchased and small networks were established at each of the state's hospitals' medical records room. These networks replaced stand alone personal computers that were vulnerable to breakdowns and loss of data. The networks enabled multiple entry points improving timeliness and elimination of back-logs combined with centralized daily backups provided the necessary safeguard against factors that caused intermittent loss of data.

In the following two years (2004-2005) and based on the availability of funds, each site was equipped with leased communication lines enabling them to have permanent internet connection which meant everyone had access to email and internet access 24/7. Parallel activity during this period was to search for a health information system that can improve data quality and integrity with enhanced reporting capabilities accommodating the Outpatient and Inpatient data entry activities. A simple unified entry and reporting system was developed and installed at each of the State's hospitals. However its limited functionality provided room for improvement and further integration of other ancillary services.

In 2006 additional funding was secured to connect all five sites, the four state hospitals and the national department of health, with the goal of creating a depository of data elements that national office required for its respective reporting purposes. This was successfully achieved at both network infrastructure and application levels. By mid 2007, data collected at each of the State hospitals were automatically transmitted to a National Health Database providing up to date access capability to data from the four FSM states for National reporting, assessment and analysis.

Adding New Applications

This established wide area network provides an environment for centralized registry and other web-based operation. Currently, the Immunization Registry (Webiz) that keeps vaccination records of all school aged children and adults in the FSM operates on this platform. The addition of Webiz to the network has enabled instant access of health workers to children's' immunization records, regardless of the child's home island. Prior to this, information was hand carried from island to island by request and it created un-necessary delays. It has also eliminated the multiplicity of records for the same individual when they moved from one island state to another. Reports produced from the registry provide an accurate snap-shot of the coverage and how well immunization is carried out in the FSM.

Emails and information portals at each site using MS SharePoint 2007 and replication of selected data elements from inpatient and outpatient registries at each State to the National data servers are also running on the same system. This network is designed and built to accommodate additional communication activities such as voice and video conferencing (currently only a chat service is available) and further up to date reporting at National level.

Users' Satisfaction

To gauge the utilization of and the users' perception of the system, a survey was carried out in July 2009. Majority of the respondents, who were users of the system, indicated that they were not only satisfied with the system but also believed that having a network that connects the four main hospitals and the four public health departments in the FSM to the National Health office improves communication and sharing of vital health information among its users pertaining to routine activities and decision making.

Achievement

In summary, the main achievements have been connectivity between the States and the National Health office in Palikir providing instant electronic communication and data transmission. Another achievement is the provision of outpatient and inpatient registry system that collects data at each state which is then replicated on a weekly basis to the National office. This has enabled generation of various reports by the FSM Statistician office. Sample reports include:

1. Top 10 diagnosis for the FSM collectively as well as by State
2. Notifiable disease list and other communicable diseases
3. Health systems and status indicators (i.e., hospital stay)
4. An auto alert system based on notifiable disease is in place to alert designated medical personnel of a possible diagnosis and preventing a possible out-break
5. Immunization record which can be easily accessed over the department's network both at the national level and the state level.

Future Outlook

The goal of having a fully integrated health information system that will capture all the data from all services and activities continues to be a focus of the management and technical staff at the National Department of Health Services.

With the Fiber Optics cable reaching FSM early this year, overall speed in connectivity between the States and to/from outside world will improve immensely. This will enhance communication, distant learning and tele-medicine to continue to progress towards a more efficient and knowledgeable work-force. The result should be better health services and improved health of the people of the FSM.

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