

CASE STUDY : UNIVERSITY OF MICHIGAN HEALTH SYSTEM***Road Map to Incorporating Wireless Network Technology at UMHS*****Thomas Peterson**Director of Personal Computers and Network Systems
Department of Pathology, The University of Michigan**Preface:**

Wireless networks have been in existence for many years. The early ones were very proprietary, expensive, and difficult to maintain. Over the past few years these types of networks have matured and our understanding on how to integrate them into our work environments has progressed. Three years ago University Hospital looked at several types of wireless LANs and embarked on a pilot to incorporate wireless technology to support the nomadic medical staff. During our initial wireless LAN journey, two major potholes were encountered (security of the mobile devices and the need to adapt our corporate application to the new mobile environment). In our pilot we used laptop computers secured to carts as the mobile communicating device platform. Our experience showed that laptops have a high home consumer value and therefore a high theft rate. The other pothole we experienced is our corporate applications built for use in our tethered workstation environment, did not perform well in our mobile environment. Bringing the computer and the network to the clinical work-site requires the applications presented at that work-site to more closely match the clinical processes that occur. If you want to capture the patient information as this information is presented, you must adapt your corporate applications to also match that mobile environment. As our initial pilot indicated there is much work to do at the customer level when integrating this type of technology in our clinical work environments. Although both concerns are still present, the ability of using portable devices that have no value outside the wireless LAN coverage area and the rise of web morphed corporate applications has effectively filled in these two potholes.

Acknowledgments:

Before I embarked on our wireless journey, I decided to invite another friend (strategic vendor partner) that would be helpful at getting to our destination. I selected this friend because he knew the roads better than I (is a vendor for wireless inventory control systems) and we travel together before (primary vendor for integrating bar coding technology in our laboratories). I would like to acknowledge their guidance in the journey.

Ben Portman and Steve Lowry,
Lowry Corporation**Destinations:**

Where are we going on this wireless journey? I have identified three destinations where we should go with an enterprise wireless network. The first area is the OR suite. The OR suites is an area of high utilization of hospital resources. Because of the nature of the business in this area, the tracking of the use of these resources is important to maintaining good financial records and supply inventories. Why does a wireless LAN help in this area? Because you can bring your corp. applications close to the patient arena where the medical staff can more easily record the transactions thereby maintaining the electronic patient record. A wireless LAN will act synergistically with a good OR patient management system.

Client:**University of
Michigan Health
System****Application:****Wireless
Networking****Industry:****Healthcare**

My second destination is at the patients' bedside on the hospital tower (esp. ER and ICU's). The usefulness of accessing patient data warehouses at the bedside, nursing station, medicine cart, phlebotomist cart, point of care testing carts, etc. is obvious. The more efficiently we can deliver information at the time decision need to be made, the more effective we can be at our patient care activities. Portability is synergistic to transaction processing. If I can lower the barriers to electronically recording the patient care transactions, we will be more successful in maintaining a financially and clinically useful electronic patient record. Some early attempts at incorporating this technology in our clinical workplaces suffered from immature wireless network applications. It is not enough to replicate our corp. application in a wireless form. The presentation of the applications must conform to the customers work environment and to the portable device constraints.

The third destination is our laboratories or other areas where shared workstations must be used to interact with the networked applications. Pathology is deploying PathNet V500, a client server version of a laboratory information system. This new system will require a PC workstation to replace all VT terminals. Here the ability to have a medical technologist sign-on to the network and maintain their connection at any worksite will lower the cost of deploying access to this and other network applications.

Magellan Journey (Pilot) - "Technology Exploration":

The Magellan pilot focuses on the third destination, our laboratories.

There are several factors to consider in our PathNet V500 application deployment. First, technologist is going to be required to sign-on/off to the network at each PC workstation that is used during the day. These sign-on/off events become more frequent in areas that perform more manual or semi-manual tests. Currently, the sign-on time takes less than five seconds with VT terminals. With a VT terminal, a technologist could afford to sign-on/off with each LIS conversation. With technologist using a PC, which requires network authentication, it takes 30 seconds and our technologist cannot afford to wait 30 seconds before it can start a LIS conversation. If log-on/off is repeated several times a day, it will surely frustrate the migratory technologist that must use multiple PC LIS access points.

The next factor focuses on the cost of the access point. In the past, these worksites had cheap LIS access points (VT terminal) and we could afford one for every worksite. Now our access points must be PC's and cost of the PC and the cost of ownership of the PC makes a good case to minimize the number of PC deployed in the laboratory. Our cost of a PC hovers around \$2,500.00/PC and the cost of ownership per year is around 5,000.00/year. If we can reduce the numbers by 20 PC, this represents a savings of \$50,000 in capital costs and \$100,000/year in support costs.

The final factor is an unknown. Because this technology allows us to adapt better to us personally, what opportunities will there be available to better incorporate an individualized electronic work environment? Our experiences with our customers' feedback will guide us where we can take advantage of this more personalized computer-work environment.

Side Trips:

One side trip on this journey of an enterprise wireless network, is the ability to support two-way alpha paging. With a wireless network, we can support two way paging. These devices will allow us to utilize our rule enabled IS engines to send alpha messages to pagers regarding important clinical events and receive verification that it was received and reviewed. In addition, we could also investigate the application of a "reflex order entry system" by utilizing multiple-choice replies on those pagers. This definitely would decrease the turn-around time of clinical response to these types of clinical events.