

## From CE to IT and Back... When Two Worlds Collide

BY RUSSELL CAIN

The terms “technology” and “engineering” often have different meanings when used in the health care environment today. When speaking of “the latest in technology,” you may think of flat screen televisions, picture telephones, and wireless personal data assistants (PDAs). Within health care, you may think of 16-slice computed tomography (CT) scanners, digital radiography, and picture archiving and communication systems (PACS). But where would technology be if it were not for the engineers behind it?

Within the last 10 years, Clinical Engineering and Information Technology (IT) departments have experienced dramatic changes in their day-to-day responsibilities as the lines between the 2 departments have become increasingly blurred by technological advancements.

For the last 12 years, I have worked in Clinical Engineering and IT. I began in Clinical Engineering, moved to IT, but returned to Clinical Engineering because I missed the technical aspects of the job. I’ve experienced both the strengths and weaknesses of both fields. In the end, the money alone was not enough to keep me in IT.

Although both worlds deal with technology, there is a clear shortcoming of excitement in IT for me. When all is said and done, IT revolves around 4 main components: personal computers, switches, servers, and routers. The engineering behind these components has remained the same for the last 10 years.

Processors may become faster and hard drives may become larger, but the basics stay the same. Clinical engineers are more adept at handling the changes in technology and can more easily move from one technical concept to another. This is something that is not only anticipated, but expected. The shortcomings between the 2 departments come from lack of understanding and knowledge.

Case in point is the IEEE standard 802.11 on Wireless Local Area Networks. Identifying limitations

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between the 2 departments is crucial. Wireless communications have been present within Clinical Engineering since the first telemetry-based Patient Monitoring System came about.

Knowing the radio frequency (RF) characteristics, such as power and frequency are a necessity when deploying a system that has good reliable coverage. Without this knowledge, a wireless network may have very poor coverage in certain areas or have coverage in areas where it is not desired, such as the employee parking lot. An IT technician is not trained in RF and most are certainly unaware of what characteristics RF has. IT needs to recognize some valuable information exists down the hallway in the Clinical Engineering department.

For example, an IT technician once requested a “Survey Tool” from a leading manufacturer of wireless products for \$2,500. Little did he know that if he took an access point, turned it on, and used an existing laptop with a wireless Network Interface Card (NIC) that he already had a Survey Tool. Simply by looking at the signal strength of the access point in relation to the laptop was enough for him to plot RF coverage for the floor. In this example, IT was at a disadvantage by not knowing RF characteristics. However, Clinical Engineering needs to realize their limitations as well.

Clinical Engineering can place RF products so that coverage is great, but do they have what it takes to secure that wireless product? Using a non-broadcasting Service Set Identifier (SSID) and enabling Wired Equivalent Privacy (WEP) with proper authentication is a must. IT can offer a lot of knowledge in the area of security. Information sharing and open communication is the best way to gain knowledge from each other.

## Career Moves

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WHEN TWO WORLDS COLLIDE

The technology industry has created an aura of mystique when it comes to IT. This mystique has led to higher wages being paid to IT professionals. Now that companies are outsourcing their departments and shipping services overseas, there is an excess number of IT professionals in the marketplace. Combine this with the fact that more and more people are becoming technologically aware; the aura of mystique will soon fade and take the high wages with it.

Stress levels are also very different between the 2 departments. Stress over a server that failed is not the same as stress over an anesthesia machine that failed. The server is an inconvenience that can be fixed within hours and the anesthesia machine can be a disaster that lasts a lifetime.

Neither side wants to fail. But Clinical Engineering will put in mechanisms to prevent the failure, whether it is through preventive maintenance inspections or affixing a label on equipment to remind the user to plug the item in to charge a battery. By contrast, IT can be more reactionary to problems. While IT may claim to be proactive in their preventive measures, they seldom take into account the human factor. The human factor is the every day actions of the user who operates the equipment. This is something Clinical Engineering is very familiar with and plans for accordingly.

While both departments are comprised of extremely smart and talented individuals, imagine what the departments could do if the lines in the sand were clear and apparent. That line in the sand will become clearer as the use of PACS continues to rise. A clinical engineer can see that today, but it may still take awhile before IT will see that we must work hand in hand for it to be a success.

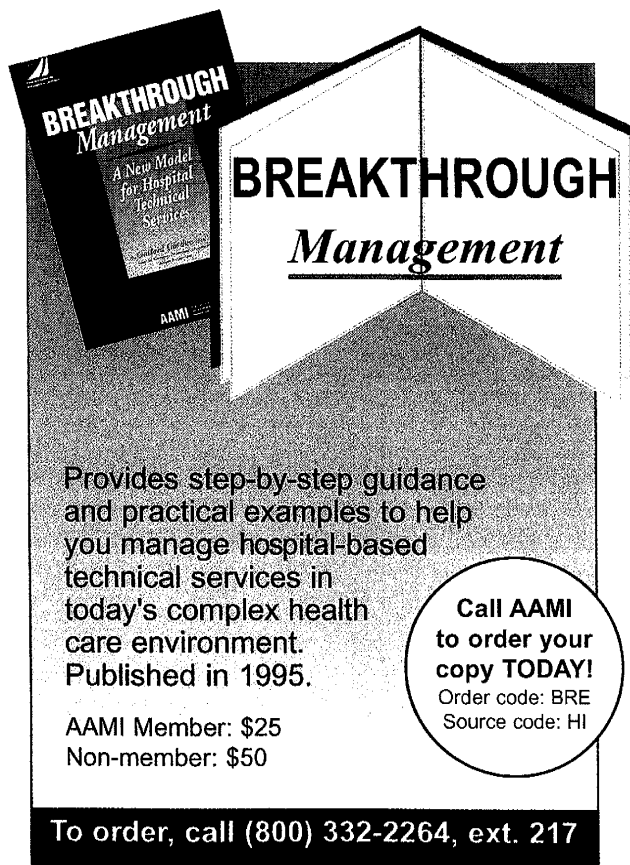
It has been my experience that Clinical Engineering will plan for the future by paying now in hopes of averting undue expense later. That's why most Patient Monitoring Systems are in place for 10 years or more. IT is quite the opposite in trying to save as much money now while often paying for it later. Clinical Engineering has a good history of planning for the worst and expecting the best, which in turn makes for rock solid decision-making and reliable system implementation and operation.

IT can learn a lot from Clinical Engineering when it comes to maintaining and planning for the long term. PACS will be the future for the 2 departments within healthcare and it should be every Clinical Engineer's

priority to focus on getting involved with the process on the support side as much as possible. Most IT departments do not know the size of images being produced by a CT scanner nor how many images are sent during a single case. This was put to the test at the facility where I am currently employed and our PACS implementation was a success.

If I were to give any advice to a person looking to move into the IT field from Clinical Engineering, it would be to think about the long term. I first made the move into IT because I thought it was cutting edge and the money was very good. I soon realized it was not cutting edge when it came to health care technology and to earn the wages others were making, I had to work in a totally different industry.

When all is done and said, the 2 departments will continue working toward that clear line in the sand and one will step over it first. Each department is pushing each other harder. I believe Clinical Engineering has the knowledge and understanding to step over the line now. ■



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