



The growth of the IT backbone: **Becoming a smart hospital**



By James A. Brownrigg

The convergence of information technology systems in healthcare building is causing us to look at more effective integration of technologies. Facing increased competition, tighter spaces, staff retention and reduced reimbursement, today's hospitals are looking at strategic ways to use technology to manage their systems.

With more than 89 percent of hospital administrators involved in constructing a new building or renovating an existing facility to meet the ever-increasing demands for space, today's hospital executives have to look closer at their work flow processes earlier in the game, in order to capitalize on the latest technologies.

A PriceWaterhouse publication recently noted that there needs to be a top-down, strategic com-



mitment to invest in technology to optimize clinical, financial and administrative processes. And it involves more than advanced healthcare information systems. It also includes ancillary technology such as medical-device integration, advanced nurse call, and advanced patient tracking.

The answers lie in what is being called today a digital or smart hospital. The future smart hospital will soon replace the conventional, inefficient, paper laden hospitals which currently exist. These new digital hospitals will reflect a truly integrated environment where medical devices and clinical information systems can be deployed for each core and ancillary functional area. The end result will be a dramatic improvement for the patient experience.

"At Sutter Health, it was found that if a physician actually interacted with the patient with the use of



a workstation — spending time with the patient — satisfaction went up,” said Jon Trigg, consultant with SynNexus. “Along with clinical system access, the same flat panel monitor can offer a patient the ability to lower the lighting, close the blinds, control room temperature, order meals and view movies as examples of technology integration.”

“A hospital can get low voltage wireless communication, but if it does not focus on improved work flows of the hospital’s systems, you don’t really have a digital hospital,” said Trigg. “Integration of processes and technologies to improve the delivery of care, providing access to information anytime, anywhere while taking advantage of integration for better energy efficiency, is at the core of a smart or digital hospital.”



Setting the vision and strategy

Healthcare executives who are currently planning or involved in expansion projects say the largest challenges involve staying abreast or ahead of the latest technological advancements in the industry, and remaining flexible to administration turnover. In order to capitalize on the optimal value of integrated digital technologies, strategic planning as early as possible is paramount.

“When it can often take eight to 10 years to build a hospital, setting the strategy and having the discipline and flexibility to implement becomes increasingly important,” said Tony Burg, principal engineer/healthcare systems planner with Sutter Health. “Projects start growing in ways that you never would have anticipated and usually those ways just add to cost and complexity.”

Sutter has recently added technologies as a fourth component to its traditional project management team of an owner, contractor and architect. “Wireless doesn’t necessarily mean less wire,” said Burg. “You still have all the pathways and infrastructure that you have to put in. And when you elevate building technologies and incorporate them with IT, it only made sense to have a technology committee to consult with because they do all the protocols. Really, it’s their backbone that we are going across.”

Going digital isn’t just something for new hospitals. Renovations and retrofitting can start to go wireless as well. According to Ed Cantwell, president and CEO of Innerwireless: “All wireless services are combined onto an engineered guaranteed distribution platform. Because of this we have to get involved in the design process. It’s important to note that while our firm has over 100 million square feet deployed, only 20 percent is designed while the other 80 million is actually retrofitting. It’s a little more challenging but can be done. We expect over the next five years, every major building will be its own cell site.”

Identifying the technologies and specification requirements of building systems helps manage modifications and unexpected cost overruns during construction. In the Turner Logistics study, 65 percent of IT professionals who managed 150 to 500 bed facilities felt it was important to seek

outside assistance to manage the integration of vendors when it came to technology project management of these complex systems. Having a consultant who understands what the equipment manufacturer is developing and how it is installed has been found to be beneficial to the entire management process.

"It's important to understand what happens if technology is to change, what is the impact to the dependency that was originally designed? Is it a pathway dependency? Cabling?" questioned Janice Bundy, associate director of Communications Technology Services at UCLA. "Make sure that throughout your project's life cycle you have planned checkpoints, so when remodeling happens you are adaptable. For example, if you are running copper low voltage data wire you need to have a pathway with 290 feet — if you exceed it you will have compromises."

According to Bundy, the IDF communication room which supports the IT backbone and desktop devices is obviously a key and critical component for a digital hospital because that is where data is passed and retrieved.

"We currently have 40 of them, plus two data centers. But when we were in the very early design phase, that was more than 10 years ago, the IDF rooms were designed to house the majority of the hospital's systems," she said. "So these critical communication rooms house your building management system, your fire alarm panels, paging system, telemetry and epilepsy monitoring, cable TV and 800 megahertz. It's important to manage this space because every time a vendor needs to access to do upgrades or maintenance or change out, you have activity in a room that has the most critical component of cabling and switches," said Bundy.

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Impacts on delivery of care

In healthcare today, there is computerization around billing and internal ancillary department operations including pharmacy, laboratory results, and image generation. But the bulk of activities that consume the time and work of most physicians, nurses, and all patients are essentially untouched by automation.

With the goal of optimizing people, processes and technology to ultimately deliver healthcare services — safer, more efficient and cost-effective — it is important to note that streamlining work flow must include systems, communications, information, and infrastructures focused on servicing the physicians, clinicians, patients, families, employees and community.

The task for designers becomes even more daunting, considering initiatives often change rapidly.

"It's the length from conception to the end of the project that seems to be a major issue. Maybe a new department manager comes in and their thought of how they're going to deliver healthcare changes. And they look at what's already been designed and they say, 'who put that in there?'" Burg said.

When redesigning processes and work flow, consider patient processing, medical information, building architecture and layout combined with a holistic approach to the improvement of the quality of patient care and maximizing financial and operational performance. These improvements are measurable in customer satisfaction across all

aspects of patients and families, clinicians, providers, employees, payers, and suppliers.

When building a smart hospital, begin with technological integration rather than struggling to integrate technology in the end. ■

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