How IoT Delivers Better Patient Care and Optimizes Healthcare Facility Operation

by Estelle Schweizer

Executive summary

As our world becomes more connected, advanced technology is extending beyond patient care and into the hospital infrastructure itself. In particular, the Internet of Things (IoT) is changing the standard of information delivery and decision-making with insight into facility data that can be used to improve operational efficiency, patient satisfaction, and safety for all. This white paper will explore the trends affecting healthcare IoT adoption, best practices for implementation, benefits, and case studies of hospitals that are leading the charge into the future of modern healthcare.

Introduction

Hospitals. Outpatient clinics. Assisted living centers. Facilities just like these seek to use advanced technology to improve patient care. As our world becomes more connected, that advanced technology extends beyond direct patient care to the facility infrastructure itself. This technology creates more efficient, safe, and pleasant healthcare experiences for patients and staff alike. In particular, the Internet of Things (IoT) offers new possibilities for healthcare structures of all sizes.

IoT, or the connection of "things" to the internet, is driving multiple trends and inspiring new workflows and practices within our homes and healthcare facilities. In addition, rising healthcare costs motivate healthcare organizations to adopt every available means to reduce those costs, including IoT. The data from all these connected things or devices is largely underutilized, but with the right tools and solutions in place, everyone—from patients and nurses to medical center managers and CEOs—can gain meaningful insight to improve and customize patient care and optimize facility operation.

Within healthcare, IoT represents the frontier, the place where outer limits are being tested and tried in both facility management and patient care. IoT is also the future—the ultimate destination for an industry beset by aging facilities and rising operating costs.

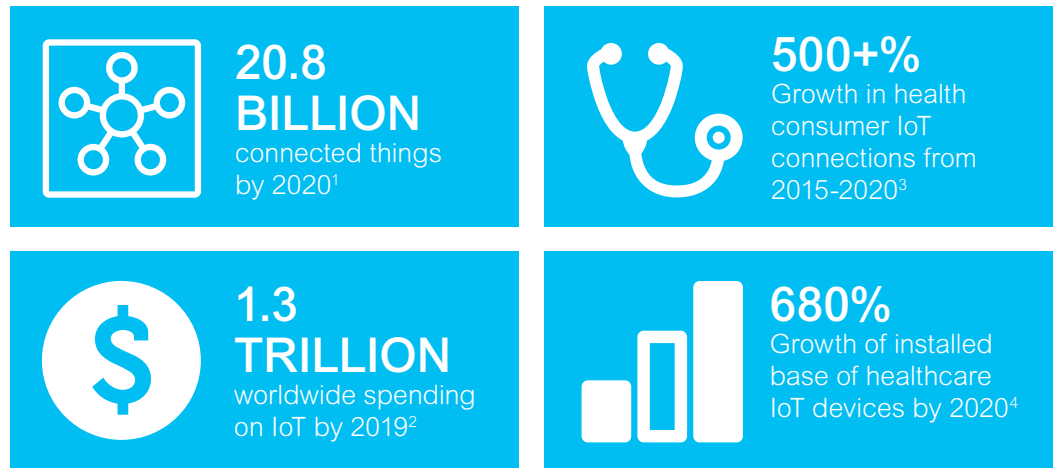## What is IoT and how has it already changed healthcare?

The Internet of Things (the collection and exchange of data between inter-connected physical devices via internet protocol) turns data into action. IoT devices allow users to connect, collect critical data, analyze, and then react to data based on real-time information to enhance performance and prevent losses. The "things" part of IoT includes physical objects that collect and exchange data over the Internet, most without any type of human input. IoT also describes the communications network that exists between objects and connected systems, delivering machine to machine (M2M) communication. IoT-enabled or "smart" devices are uniquely identifiable and can be sensed and controlled remotely.

There are many types of IoT objects. Consumers have embraced healthcare IoT through personal devices, such as the Apple Watch and Fitbit, which can track exercise, sleep, and other health goals. Some insurance companies even offer discounts to subscribers who wear Fitbits and allow the insurance company to track their exercise. More recently, the business side of healthcare has begun to explore how IoT can impact facility operations and deliver better patient care.

IoT is already a burgeoning field and that explosive growth is expected to continue. IoT growth is global and crosses multiple business sectors, but perhaps no sector is being impacted as quickly or pervasively as healthcare, as shown in Figure 1.

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Figure 1

4 reasons why the future of modern healthcare is in IoT

20.8 BILLION
connected things by 2020[1]

500+%
Growth in health consumer IoT connections from 2015-2020[3]

1.3 TRILLION
worldwide spending on IoT by 2019[2]

680%
Growth of installed base of healthcare IoT devices by 2020[4]

What trends are emerging in healthcare IoT?

Beyond the more obvious trends in wearables and M2M communication, facility management and operation are now a focus for IoT-enabled improvement. Connected devices feed data to building, IT, power, security, and clinical management systems to create smart hospitals. Healthcare leaders see the potential that IoT has to improve operational efficiency, as well as safety and satisfaction for patients.

Greater unification of information technology (IT) and operations technology (OT)

IT/OT convergence is a new layer of digital transformation happening inside businesses, including health facilities. IT comprises the computer systems and networks that store, manage, and harvest business data. OT is similar. It's the hardware and software required to make the highest and best use of staff, resources, equipment, and facilities—all the resources used to operate an organization. The IT/OT convergence is the integration of these two. Data collected from IoT-enabled devices is used to drive better decision making and process improvements.

IT/OT convergence relies on the presence of a secure, open, scalable, and flexible IoT platform, which bridges the IT/OT gap and connects three core layers—connected products, monitoring and control software, and apps and analytics. This platform should provide a digital healthcare infrastructure with:

● Embedded connectivity and intelligence

● Smart control, management, automation, and optimization

● Cloud-based digital services

This convergence will lead to greater utilization and ROI of "connected" infrastructure devices such as temperature sensors, power meters, circuit breaker panels, uninterruptible power supply (UPS) devices, building automation controllers, real-time location system devices, and more. These IoT-enabled devices provide embedded

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[1] Gartner, Inc. Gartner Says 6.4 Billion Connected "Things" Will Be in Use in 2016, Up 30 Percent From 2015. (2015)

[2] International Data Corporation (IDC). Internet of Things Spending Forecast to Reach Nearly $1.3 Trillion in 2019 Led by Widespread Initiatives and Outlays Across Asia/Pacific. (2015)

[3] Cisco. Cisco Visual Networking Index Predicts Near-Tripling of IP Traffic by 2020. (2016)

[4] Business Insider. Internet of Things in Healthcare: Information Technology in Health. (2016)

[**] Excluding wearables like fitness trackers

intelligence and control, can often be controlled and monitored via cloud, and with the help of software, can provide advanced data analytics. For example, sensors on electrical equipment can predict when maintenance is needed before the equipment fails and causes a risk to patient safety. This type of predictive maintenance keeps expensive equipment running efficiently and shortens downtime maintenance cycles.

In new facilities, IT/OT convergence will be built into the design plans, allowing for optimal technology interoperability. In aging facilities, a technology layer will update legacy infrastructure, making it future-ready. The convergence will allow both sides of the technology equation to work together to produce a result that provides added value to the healthcare organization as a whole.

Improving patient experience and driving patient-centered care

In health facilities, patient satisfaction will grow in importance as healthcare options offer patients more choice. Many countries follow a "pay for performance" model where healthcare organizations are reimbursed either from insurance or the government. In the US, a percentage of that reimbursement depends on the patient's experience while in the hospital and is linked to infection rates and readmissions. Several organizations also conduct and publish hospital ratings online. Poor ratings in combination with public opinion reviews through sites such as Healthgrades and Yelp can further damage the hospital's reputation and drive patients to seek care elsewhere.

Through IoT, there will be new opportunities to build patient loyalty and satisfaction, which ultimately leads to better patient outcomes—a main driver for hospitals around the world. IoT puts a measure of control into the hands of patients through solutions such as patient room control mobile apps. Using an app installed on a tablet or smart phone, patients
can create their own optimal healing environment through individual control over their room temperature, lighting, and window blinds, rather than calling on nurses to perform these mundane tasks. In turn, this helps nurses focus on clinical tasks that will improve patient care.

Patient safety presents another top concern. In healthcare facilities, uninterrupted access to power can mean the difference between life and death. Hospitals and surgical centers need constant, reliable power to feed medical instruments, life support machines, and diagnostic equipment. A one-day power loss can cost a hospital upwards of $1 million[*] and patients their health or even their lives.

IoT-enabled power management solutions such as smart electrical panels, connected power metering devices, and power monitoring software can ensure reliable electrical power to critical areas, identify potential issues before a power failure occurs, reduce operating theater downtime, and automatically test emergency power supply systems.

Many other patient safety concerns arise in health facilities. Violence, infant abduction, and falls present just a few. IoT security management solutions are powered by connected devices such as IP video cameras and real-time location system (RTLS) tags. These devices integrate with building management and access control. They help security personnel keep watch on what's going on throughout the hospital campus and control access for patients, visitors, and staff.

[*5]Schneider Electric. How Unreliable Power Affects the Business Value of a Hospital. (2010)

Better utilization, tracking, and maintenance of medical equipment

Many health facilities that currently leverage IoT focus on managing their medical equipment. That includes use of radio-frequency identification (RFID) tags and RTLS. These technologies can track equipment, patients, and staff as they move throughout the hospital. Using IoT for this purpose has been an easy business case to make because the ROI is measurable and benefits are immediate.

For patients, the use of tracking technology means equipment will be available when it's needed, providing better and faster care. When tagged with sensors, equipment is always locatable, meaning health workers no longer need to spend precious time hunting down devices. Additionally, sensors track use patterns, revealing what equipment is used and what's not. These patterns can reveal when more machines should be purchased, have left an authorized area, or require service.

Use patterns can also apply to patient flow. By providing patients with an RTLS bracelet, executives can examine wait times, transfer times, and the entire journey from admission to discharge.

Cutting costs without cutting service

Like so many other sectors, healthcare facilities face the need to do more with less. Their operating costs continue to rise, while their operating budgets decline. For most businesses, reducing staff is a traditional cost-cutting measure. But in healthcare, this step can harm the patients these facilities exist to serve. For many, energy and operational efficiencies become the best choice to reduce operating costs but without a negative impact on patient care. For instance, by using embedded devices to collect data for compliance reporting, the manual process of collecting that data is eased, and staff that once spent hours on that task can now refocus their efforts on other critical assignments. Or take the case of monitoring the temperature of the blood storage refrigerator, a task that is usually performed by a lead nurse. With an IoT solution, an embedded device can automatically record the temperature, log it, provide reports, and allow that nurse to spend more time with patients.

Rising healthcare costs put added pressure on hospitals to reduce their operating expenses. Energy efficiency is a hidden opportunity to help health facilities reduce operating costs and improve their financial health. The International Energy Agency estimates the cost to meet the world's energy demands at $26.3 trillion through 2030. That averages to more than $1 trillion a year.[*] When health facilities experience energy cost increases, those expenses take away funds available for patient care.

New construction has the benefit of being built to meet today and tomorrow's digital needs from the ground up. Existing hospitals, on the other hand, don't have the luxury of being able to rip and replace old infrastructure. Aging facilities compound the problem of energy costs. In the US, most hospitals are 30+ years old. In the UK, that age rises significantly. Many aging facilities are not equipped with the right infrastructure to support energy and business efficiency. Some can barely keep up with their backlog of maintenance, let alone comply with new stringent sustainability regulations. IoT technology helps these facilities keep legacy systems, while identifying new opportunities for cost reduction. For example, by using cloud-based, automated building analytics and diagnostics software, hospitals can identify energy savings


[*6]Worldwatch Institute. *Energy Agency Predicts High Prices in Future*. (2016)

opportunities and prioritize those with the greatest impact for the least investment. This type of software is so intelligent it can predict how much a health facility can save by implementing a specific energy conservation measure or performing maintenance on a particular asset. With an asset performance management solution in place, hospitals can expect to reduce maintenance costs by 25-30%, eliminate equipment breakdown by 70-75%, and reduce equipment downtime due to failure by 35-45%.

According to Figure 2 produced by Deloitte, a smart building can save upwards of $18 million in operating expenses over a traditional, non IoT-enabled building.

Figure 2

Illustrative cost breakdown of a $40M building
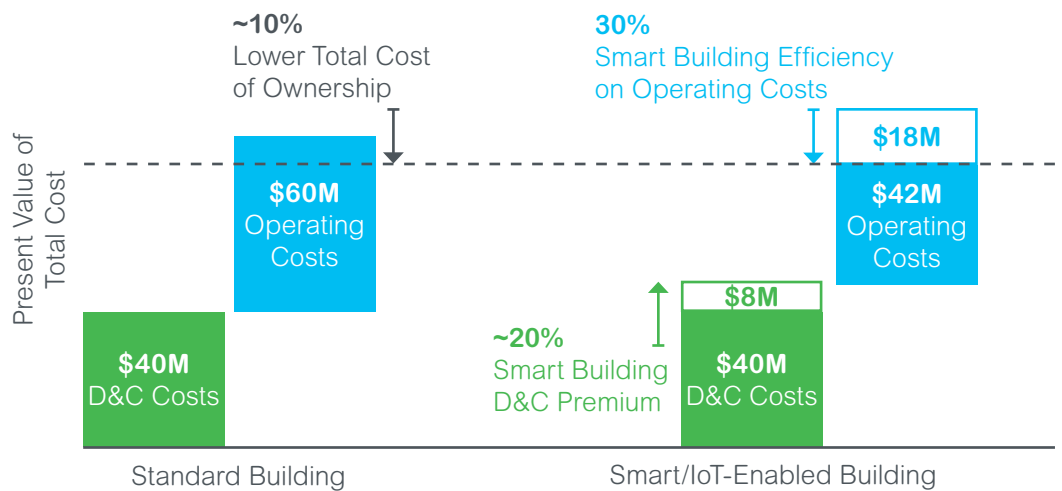
And Schneider Electric estimates that a smart, connect hospital can save over 18 million dollars a year for 20 years with IoT solutions implemented in the design-phase of a new hospital construction project. As shown in Figure 3, the greatest impact comes from solutions that improve operational efficiency and patient satisfaction.

Figure 3

Big savings for smart hospitals

Savings: $18.5M
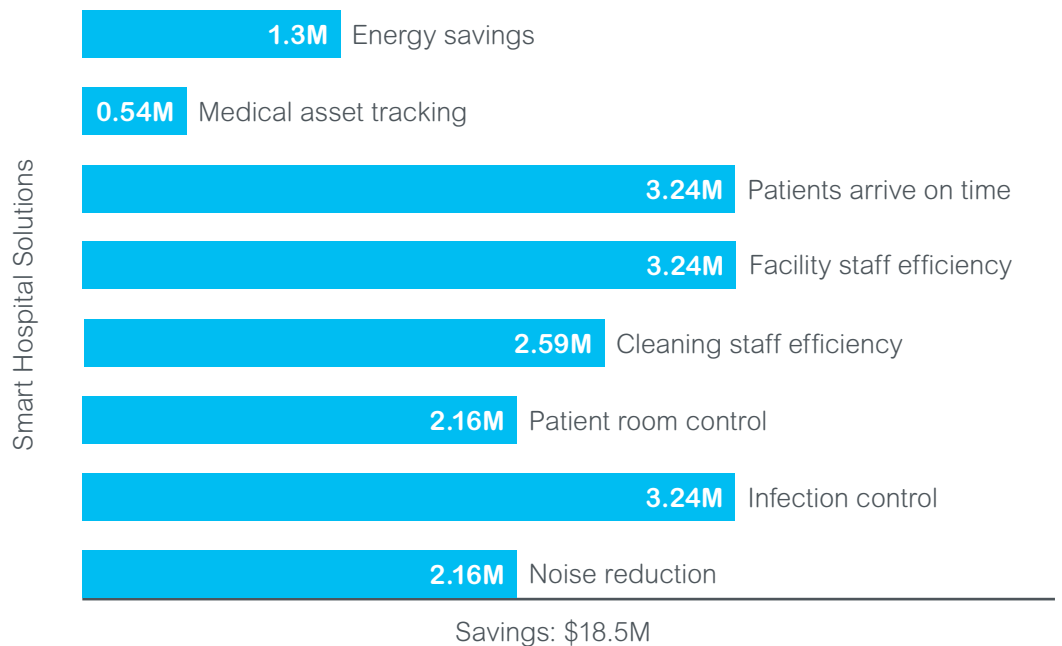
Innovation at every level of the modern health facility

Today's health facilities must lower costs but increase care. These competing demands push resource limits and drive healthcare executives to find new ways to build innovation into every level of their facilities.

There are six key building blocks to building a hospital that can answer these challenges. Built on IoT, those six building blocks are:

1. energy management
2. asset management
3. workplace efficiency
4. intelligent power distribution and management
5. intelligent building management
6. smart, connected products

Figure 4 provides a sample visual of this architecture.

Figure 4

An IoT-enabled hospital relies on connected products, edge control software, and apps, analytics, and services

End-to-end Cyber Security | Cloud and/or On Premise | Apps, Analytics & Servies | Edge Control | Connected Products
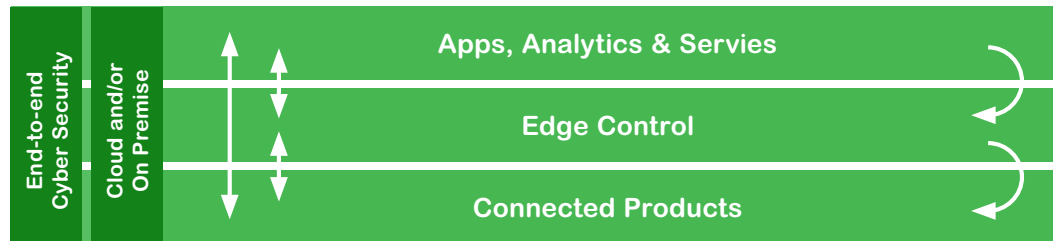
Energy management

Hospitals consume large amounts of energy (second only to the food service industry) because they are open around the clock, use energy-intensive equipment, and have specialized HVAC needs. Beyond medical services, these facilities engage in other energy-intensive work like food service and refrigeration, computer and server use, and laundry.

Too often hospitals don't consider energy efficiency initiatives as a way to cut operating costs. Energy efficiency projects have long-term benefits; by reducing operating costs today, savings can be reinvested tomorrow in new equipment and technologies that deliver better patient care.

One example of proactive energy management is the use of a building management system (BMS). A BMS helps a facility automate HVAC, lighting, and plumbing; optimize energy consumption; and maintain a healthy and productive environment. This was the solution chosen by Queen Elizabeth University Hospital, the largest critical care complex in Scotland. The facility uses intelligent building, power, and security management that integrates HVAC, lighting, fire, security, CCTV, electrical distribution, power quality management, and energy monitoring. The project aims to achieve energy and carbon targets. With this solution in place, the facility will achieve optimum performance. (Read the full case study here.)

Other medical buildings, such as research laboratories have similar energy challenges. Such was the case with a large research lab in the Boston, Massachusetts area, where a building analytics solution was installed. The facility was equipped with state-of-the-

art energy efficient HVAC systems to serve a mix of laboratory, office, and educational space. Using diagnostics and reporting from building analytics software, several major problems were identified, including leaking and malfunctioning cooling coil valves in three air handlers and leaking heating coil valves in almost 200 VAV boxes. Based on the recommendations provided, the operations team was able to schedule repairs by prioritizing the most wasteful leaks first. Repairs resulted in $286,000 in annual savings. The building continues to use building analytics to discover faults, accelerate retro-commissioning activities, and automate verification of energy investments.

Asset management

Asset management serves to balance the costs of asset replacement (capital expenses or CapEx) and operational costs (operating expenses or OpEx) that come from aging assets. Asset management has gained new appeal because businesses now realize the cost of poorly managed assets have a trickledown effect; ill-managed assets deliver less than optimal performance and create waste through man-hours and budget needed to perform maintenance or replacement and preventable downtime.

Healthcare facilities seek to overcome this waste using IoT. Sensors and meters feed data to a management system so assets can be monitored based on real-time information about their capacity and condition. These sensors also provide a way to save on maintenance costs as the cost of replacing equipment after failure is much more expensive that simply maintaining the equipment and preventing failure in the first place.

Utilizing an asset performance management as a service (APMaaS) solution, equipment performance can be monitored remotely for potential issues, and then a team of consultative experts can recommend how best to address any problems. Predictive models can be built from this data to reveal a weakened or underperforming asset. The asset can then be proactively maintained or even replaced, saving the time and money involved in an unplanned outage.

Figure 5

Benefits of asset performance management

Improved Safety
- Reduced personal risk. Early warning of impending equipment failures.

Optimized Operational Performance
- Reduced unscheduled downtime. Increased asset useful life. Decreased time to fix.

Improved Financial Efficiency
- Optimized total cost of ownership. Optimized risk mitigation. Decreased risk of failure.

Peace of Mind
- Provided asset ecosystem insights. Enhanced consistent experience across enterprise. Multi-site approach.

The University of Rochester Hospital, a nationally recognized research and teaching hospital located in New York experienced a transformer failure that led to $1 million in repairs. The center chose to implement an APMaaS solution specifically for electrical assets. After the cloud-based solution was in place, the center found a second transformer in danger of failure. By replacing it immediately, they saved themselves from another $1 million failure. By using IoT and analytics, the center had actionable predictive maintenance information. With that data, they protected both their budget and patient safety. Watch the video.

Workplace efficiency

Hospitals are asset rich, meaning they are full of invaluable people, technology, and resources. Keeping things running smoothly and optimally is a challenge in a fast-paced, ever-changing environment. Process and workplace inefficiencies can lead to disruptions in patient care as well as staff dissatisfaction.

For example, searching for equipment or patients is an inefficient use of a healthcare professional's time. Yet studies show that nurses often spend up to one hour each shift searching for equipment. That's one less hour spent with patients. With IoT-enabled RTLS tracking, location of equipment and patients is always known. RTLS can also help to right-size inventory. Hospitals often overstock everything from wheelchairs to gauze pads because these assets often go missing either through theft or asset hiding—when a medical professional hides supplies so they don't have to search for them later. With RTLS, nursing staff can always know how much of any asset is on hand, avoid overstock, and eliminate the need to create a personal supply stash.

Sources of noise:

- Paging systems
- Medical equipment alarms
- Moving bed rails
- Telephones
- Entertainment systems
- Conversation
- Ice machines and disposal bins
- Pneumatic tubes
- Rolling carts and hospital beds
- HVAC systems
- And many more…

In addition to hunting for equipment, another poor use of health professionals' time is adjusting environment controls in patient rooms. If a patient is too hot, too cold, or needs lights to be lowered, it can take a nurse away from critical patient care to adjust for these needs. Some hospital facilities now use mobile apps to combat this inefficiency. This cloud-based solution allows the design and deployment of customizable apps to either hospital or patient-owned tablets and smart phones. Using specific control widgets within the app, a patient can adjust their own room temperature, lighting, window blinds, television, or even call a nurse if needed. This sort of control improves overall patient satisfaction and keeps nurses focused on care.

Excessive noise is another area that can undermine patient satisfaction and staff focus. You may be surprised to learn that the night noise level in a hospital sits between 50 and 80 decibels, roughly the loudness of a chainsaw.[*] This level of noise affects patient recovery and affects staff too. Staff exposed to noise perceive greater work pressure, stress, and annoyance. It may add to fatigue, exhaustion, and burnout, and create difficulty communicating with others, which can lead to medical errors. By installing noise monitoring devices that are integrated with the BMS, nurses can see in real-time when noise levels are exceeding recommended limits and investigate the cause. Noise trend logs over time can be used to help identify a reoccurring cause of noise, whether it be chatter at the nurse's station, HVAC noise, rolling carts, or medical equipment alarms.

Hospitals provide critical services during the most adverse conditions. During natural disasters workplace efficiency is vital. Adverse weather affects health facilities because it may increase emergency admissions. It may also mean that some staff cannot get to work. In addition, it can wreak havoc on the hospital's power supply. Weather prediction

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[*7] Advisory Board. High hospital noise levels hinder patient recovery. (2012)

becomes a necessary tool in assessing what people and assets may be needed to respond to weather conditions. This information helps facilities with decision making, planning, and communications.

Northwell Health in New York is the second-largest, non-profit secular healthcare system in the United States. With 15 hospitals spread over a large geographic area, snow and thunderstorms can cause power outages that disrupt patient transportation. Northwell Health requires fast and accurate weather notification for each facility. The health system chose an online weather prediction solution that provides information on storm tracking, forecasts, real-time lightning detection, alerts, and meteorological consulting. As a result, Northwell Health can better prepare facilities for approaching weather concerns and ensure safer transport of patients between facilities.

The combination of these tools delivers a highly efficient workplace where staff can simplify their daily tasks and medical equipment assets are used optimally so patients receive better care.

Intelligent power distribution and management

Power is the beating heart of a healthcare facility. Without it, the hospital cannot function. Intelligent power distribution and management combines software and hardware to ensure power quality and reliability. In a healthcare environment, this may include:

- electrical distribution - through smart panels
- metering - measuring power consumption
- monitoring - a system that offers real-time data on power use
- fault detection - automatic alerts of electrical faults
- automatic generator or emergency power supply system (EPSS) testing - in many countries, mandated for health facilities
- operating theater environment monitoring - where loss of power can have life or death consequences

Because of the critical nature of hospital power, an IoT-enabled power monitoring system also provides automated testing of the emergency power supply. Such an EPSS test can collect data from and control key assets in the systems - generators and automatic transfer switches (ATS) - and test these assets regularly to confirm their optimal operation and a reliable backup power system for hospital and patients. This not only increases reliability due to the accurate monitoring and recording of test parameters, it greatly reduces the staffing burden for such tests.

Through automation, the EPSS test solution ensures that:

- Tests are run properly (length of test, equipment involved, etc.).
- Accurate data is gathered from every required point in the system.
- Every required test parameter is included.
- Data can be easily analyzed and collated for all required reports.
- Tests are easier for staff to manage and less disruptive to operations.
- This solution offers 99.99% reliability, and reduces testing and reporting time by 30%.

Smart panels provide another means of intelligent power management. These panels are essentially a circuit breaker and meter in one and provide information on circuit breaker status from a digital screen within the panel.

Operating theater environment monitoring is another IoT-enabled power management solution that provides real-time information on power status, room temp, and more from one screen. In the event that a power fault occurs, nurses and surgeons can quickly assess the electrical health within the operating room and determine if they have enough power to continue the surgery or if they need to stop the surgery and reschedule. Patients are also protected from electrical shocks with standard compliant insulation monitoring system information available within the same screen. With these tools, healthcare professionals have the information they need to prevent operating room downtime and ensure patient and staff safety.

Moorfields Eye Hospital in London is a world-class center of excellence for ophthalmic research and education. The century-old eye hospital had multiple legacy systems, an aging infrastructure, and a global reputation to uphold. Moorfields opted to install an innovative suite of digital healthcare solutions, including intelligent building management, operating theater environment monitoring, RTLS, and more. Since installing the solution suite, the hospital has experienced no downtime in any of the theaters, which has in turn reduced waiting times and improved the overall patient experience; operating expenses have gone down; the visibility and quality of care has increased for patients; and staff productivity has improved due to less man-hours needed to maintain the systems. Watch the video.

Intelligent building management

Healthcare organizations need a single, future-ready building management system (BMS) solution that makes their facilities safe, secure, comfortable, and efficient. The BMS needs to be scalable, open, flexible, and act as the IP backbone to connect energy, automation, and software.

Acting as the hospital's digital hub, an intelligent BMS links critical systems across the enterprise so data can be collected, analyzed, and managed to optimize operational performance while driving 30-40% more energy efficiency, as well as comfort and safety for all. An IoT-enabled BMS takes a hybrid approach and uses the cloud or is hosted on-premise. In essence, the BMS uses IoT to network systems and devices that may not have been connected before, like lighting; HVAC; security and access control; and control devices, such as valves, actuators, sensors and meters

By leveraging IoT, the BMS can also integrate with other important building systems, such as power and data centers, as well as with external third-party data, to provide comprehensive management of the holistic building ecosystem.

Figure 6

An intelligent BMS acts as the hospital's digital hub.

Analytics engine to drive building lifecycle services

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Figure 6 (continued)

Building integration platform

- Access control
- Power management
- Light & room control
- Space management

Full IP backbone & IoT enabler

- Sensing, control & communication
- Connect building occupants to data & services
- Maximize building value

The South Australian Health and Medical Research Institute (SAHMRI) is a 25,000-square-metre facility. Their goal was to build a highly intelligent, responsive facility that maximizes operational efficiencies, energy conservation, and security while reducing risk, meeting regulatory compliance, and achieving green building certification. The building uses an intelligent BMS platform that manages heating and cooling, energy management, security, and lab controls. In addition, an intelligent metering system provides real-time data on energy and water consumption, enabling facility managers to proactively identify issues and adjust operations to minimize resource consumption. Learn more about the world-class SAHMRI facility in this case study.

The Australian Centre for Health Innovation provides another case study for intelligent building management. Their goal was to test and prove solutions that could be used in a healthcare setting to improve operational efficiency. With an intelligent building management system, they found that healthcare workers could receive the right information at the right time to help them improve patient care and staff productivity. Local medical staff were brought in to test the solution, and they determined that with the system in place, staff were able to see at a glance what was going on in their hospital environment through seamless and rapid information delivery specific to the user. With this data close at hand, care decisions could be made quickly and effectively. Watch this video for additional information.

Smart, connected products

Today's smart hospital relies on embedded connectivity and intelligence. Connected circuit breakers, smart panels, meters, sensors, relays, uninterrupted power supplies, and real-time location systems break down the silos of the past. In the connected system, assets are not wasted, energy is not lost, staff remain productive, and patient care is timely and efficient.

A children's hospital in Australia began construction of a $1.2 billion pediatric trauma center designed to replace an aging facility. The goal was to create a complete digital hospital infrastructure. The design included a full suite of intelligent building, power, and security management; patient room control apps; smart connect devices; and IT/OT integration with enterprise service bus architecture. The objective was to ensure patient satisfaction by creating an "at home" environment. The design simplified daily activities in the facility and improved operational efficiency by accessing more than 50 systems in a single, seamless interface. This wide-ranging connection will give staff the real-time information they need to quickly and effectively deliver care. When complete, this new hospital will be a centerpiece of the area's child healthcare system.

The competitive advantages of a health facility that adopts IoT

The story of IoT is connection. The world is more connected than ever. That connection has taken place in industry and manufacturing and is making ever-increasing inroads into healthcare as well. That has resulted from the digitization of our lives. Electronic health records, digital imaging, telemedicine—all are made possible through highly reliable and available network connectivity.

With aging infrastructure and growing populations, the world's health facilities will strain under the pressure. In healthcare, traditional cost-cutting techniques—like reducing staff or services—simply do not work. Instead, they place patient and employee health and safety at risk.

As a healthcare facility, how will you improve performance, patient safety, and patient satisfaction? It all comes down to bringing the right information, to the right person, at the right time. To do that, all hospital infrastructure systems need to communicate intelligently.

For new facilities, this infrastructure process needs to take place up front. There should be a plan from the start to make all the infrastructure work together seamlessly. For older facilities, the process involves retro-commissioning and determining how to make disparate systems communicate.

IoT makes cost cutting possible by making facility, asset, and energy management easier. Imagine a hospital that delivers better patient outcomes; improved asset use; increased patient-centered care; reduced energy consumption; no operating room downtime; and information that can be used to stay ahead rather than simply keep up. Representing both the frontier and the future of healthcare, these are the advantages that IoT brings to a health facility.

✎ About the author

Estelle Schweizer is a Strategic Marketing and Communications Manager at Schneider Electric, where she provides marketing excellence and thought leadership. With almost ten years supporting the healthcare segment, Estelle has a passion for helping customers understand how they can improve operational efficiency, patient satisfaction, and safety for all with EcoStruxure for Healthcare. To learn more about how we create Innovation at Every Level in hospitals, visit our blog or follow us on LinkedIn and Twitter.

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