The Future of Hospital Facilities Design

IHEA Meeting
30 April 2010
Melbourne, Australia

Michael Sullivan
Healthcare Solution Vice President
Schneider Electric
Agenda

• How hospital buildings impact hospital top priorities
  • Financial performance
  • Patient Safety
  • Patient satisfaction

• Designing and building the hospital of the future
  • Trends
  • Current Technology
  • Future Technology
  • Old way of working
  • New way of working
# Hospital CEO Top Concerns

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Financial Challenges</td>
<td>77 %</td>
<td>70 %</td>
<td>72 %</td>
</tr>
<tr>
<td>Patient Safety &amp; Quality</td>
<td>43 %</td>
<td>33 %</td>
<td>29 %</td>
</tr>
<tr>
<td>Physician - Hospital Rel.</td>
<td>32 %</td>
<td>35 %</td>
<td>40 %</td>
</tr>
<tr>
<td>Personnel Shortages</td>
<td>30 %</td>
<td>30 %</td>
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</tr>
<tr>
<td>Government Mandates</td>
<td>26 %</td>
<td>22 %</td>
<td>23 %</td>
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<tr>
<td>Patient Satisfaction</td>
<td>22 %</td>
<td>17 %</td>
<td>16 %</td>
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<tr>
<td>Capacity</td>
<td>16 %</td>
<td>11 %</td>
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Improve Your Hospital’s Financial Performance

with Energy Efficiency Solutions
Trends in Healthcare (USA)

Energy Costs have increased 20% since 1995 and are projected to grow 25% in the next 5 years

Energy use in healthcare has increased 36% since 1995 due to more technology, patients and data centers

Profit Margins in healthcare have eroded from 6.5% to 5.2% - a 25% decrease – in 10 years.

1 Average cost per kWh in United States from Energy Management Systems for Commercial Buildings, Pike Research, 2009
2 Energy Information Administration
3 Profit Margins: ASHE Healthcare energy guidebook, 2003
4 Energy Intensity: Energy Information Administration
Trends in Healthcare (Europe)

Energy Costs have increased 20% since 1995 and are projected to grow 25% in the next 5 years.

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Profit Margins in healthcare have eroded from 6.5% to 5.2% - a 25% decrease – in 10 years.

2 2009 Electric Market Forecasting Conference, Dr Stephan Sharma
3 Profit Margins: ASHE Healthcare energy guidebook, 2003
4 Energy Intensity: Energy Information Administration
A 25% increase in energy costs can reduce hospital margins by 0.5%

### Financial impact of 25% rise in utility costs

<table>
<thead>
<tr>
<th></th>
<th>Hospital current financial performance ($ 000)</th>
<th>If utility costs rise 25%</th>
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<tbody>
<tr>
<td>Total Operating Revenue</td>
<td>159,259</td>
<td>159,259</td>
</tr>
<tr>
<td>Total Operating Expenses</td>
<td>154,066</td>
<td>155,029</td>
</tr>
<tr>
<td>Income (Loss) from Operations</td>
<td>5,193</td>
<td>4,230</td>
</tr>
<tr>
<td>Magin</td>
<td>3.3%</td>
<td>2.7%</td>
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*Note: Utility costs are currently ~2.5% of Operating expenses, or $3.85M in this example*
Possibilities

Achieving Cost Savings

Primary Drivers
- Clinical Quality
  - Coordination of Care
  - Adverse events
  - Readmissions
- Staffing
  - Turnover / Recruitment
  - Premium Pay
  - Sick Days
  - Staffing Efficiency
- Utility Costs
  - Energy costs
  - Energy intensity
  - Energy efficiency
- Patient Flow
  - Match capacity-demand
  - Hospital throughput
  - Ambulatory throughput
- Supply Chain
  - Mass purchasing
  - Pharmaceuticals
  - Wasted Materials
- Mismatched Services
  - Admin service waste
  - End of life care
  - Unnecessary procedures

Secondary Drivers
- Coordination of Care
- Adverse events
- Readmissions
- Turnover / Recruitment
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Possible Projects
- EHR system.
  - Cost: $10 million
  - ROI: difficult to prove
- Redesign processes.
  - Difficult link to nursing turnover costs
- Energy efficiency
  - Directly measurable short term results with low risk
- Operating room flow software.
  - Requires staff behavior change.
- Renegotiate supply contracts.
  - Difficult to sustain savings over time
- Align accounts receivables with industry benchmarks.
Energy Efficiency solutions can significantly increase hospital margins

### Impact of Schneider Electric Energy Efficiency Solutions

<table>
<thead>
<tr>
<th>Financial performance (with 25% increase in utility costs)</th>
<th>10% Energy savings (000)</th>
<th>20% Energy savings (000)</th>
<th>30% Energy savings (000)</th>
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<tr>
<th>Current utility costs (2.5% OPEX)</th>
<th>per patient day</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current utility costs (2.5% OPEX)</td>
<td>75</td>
<td>3,850,000</td>
</tr>
<tr>
<td>Utility costs with 25% cost increase</td>
<td>94</td>
<td>4,813,000</td>
</tr>
<tr>
<td>10% savings</td>
<td>9</td>
<td>481,300</td>
</tr>
<tr>
<td>20% savings</td>
<td>19</td>
<td>962,600</td>
</tr>
<tr>
<td>30% savings</td>
<td>28</td>
<td>1,443,900</td>
</tr>
</tbody>
</table>

Patient days = 51465

Trapped savings that could be reinvested or directly improve the bottom line

Adjusted Patient Days for a typical 235 bed hospital with 59.8% maintained bed occupancy
Hospital Energy Solutions save up to 30% with an IRR exceeding 10%

- **Quick Win Energy Efficiency project**
  - 10% savings on utility costs

- **Advanced Energy Efficiency project**
  - 20% savings on utility costs
  - Detailed audits and advanced monitoring/control

- **Comprehensive Energy Project**
  - 30% savings on utility costs
  - Improve asset valuation with infrastructure upgrades

See how much you can save!
# Comprehensive Demand and Supply Side Energy Services Save You More

<table>
<thead>
<tr>
<th>Energy Source</th>
<th>Energy Infrastructure</th>
<th>Energy Analysis</th>
<th>Building Retrofits</th>
<th>Ongoing Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>Electrical distribution</td>
<td>Energy consulting</td>
<td>Complete projects and systems</td>
<td>Meters and Monitoring</td>
</tr>
<tr>
<td>Response</td>
<td>Advanced metering</td>
<td>Energy lifecycle programs</td>
<td>Building management systems</td>
<td>Remote monitoring</td>
</tr>
<tr>
<td>Incentives</td>
<td>Critical power solutions</td>
<td>Energy Surveys</td>
<td>Drives, motion control, motor control</td>
<td>Carbon reporting</td>
</tr>
<tr>
<td>Emergency/</td>
<td>Commodity procurement</td>
<td>ROI analysis</td>
<td>Power factor correction, filtering</td>
<td>Long term energy planning</td>
</tr>
<tr>
<td>standby</td>
<td>Rate analysis/</td>
<td>Sustainable</td>
<td>Lighting and sensors</td>
<td>Executive reporting</td>
</tr>
<tr>
<td>generation</td>
<td>negotiation</td>
<td>solutions (LEED and NABERS)</td>
<td>HVAC optimization and upgrades</td>
<td>Training</td>
</tr>
<tr>
<td>Renewable</td>
<td>Energy price risk</td>
<td>System Design</td>
<td>Building Envelope</td>
<td>Pro-active maintenance</td>
</tr>
<tr>
<td>energy sources</td>
<td>management</td>
<td></td>
<td>Water Conservation</td>
<td>Building Optimization</td>
</tr>
<tr>
<td>Rebates and</td>
<td>Billing admin and</td>
<td>Waste Heat capture</td>
<td>Guaranteed and non-guaranteed</td>
<td></td>
</tr>
<tr>
<td>Incentives</td>
<td>payment</td>
<td>Carbon tracking</td>
<td></td>
<td></td>
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<tr>
<td>Energy</td>
<td>Market/ regulatory</td>
<td>Demand Response</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forecasting</td>
<td>analysis</td>
<td>On-site renewables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>and Procurement</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Proven Success

- As a Global Leader in Energy Management, Schneider Electric has helped a lot of hospitals improving their bottom line by reducing energy costs.
- Among those:
  - The Grail Memorial
  - Region Fastigheter, Sweden
  - BMI Healthcare Bath, UK, Payback < 2 years
  - The Hiram J. Andrews Center, US
  - Kittitas Valley Community Hospitals, US

Annual Energy Savings:

- $1,240,000
- $74,055
- $82,440
- €>1,000,000
Patient Safety

Save Lives by
Reducing Preventable Adverse Events
Patient Safety: A serious global problem

- The World Health Organization (WHO) estimates that in developed countries as many as 1 in 10 patients is harmed while receiving care in well-funded and technologically advanced hospital settings.¹

- In the United States, 2 million patients will be harmed and 120,000 people will die this year because of preventable adverse events in hospitals. In the UK, the NHS estimates 850,000 will be harmed.² The 1995 Quality in Australian Health Care Study (QAHCS) found an adverse-event rate of 16.6% among hospital patients.³

- By comparison, your chances of being harmed in a commercial airplane are 1 in 1,000,000.

1 World Health Organization
3 “Quality if Australian Health Care Study” 1995
Hospitals are less safe than other industries

![Graph showing error rates across different industries](image)

- Hospitals
- Extreme mountain climbing
- Motorcycle racing
- Bungee jumping
- Scheduled airlines
- Nuclear power
- European railroads
- Aircraft carriers
- Auto driving
- Chemical industry
- Charter flights

Log (10) Error Rate

Sources:
- Amalberti, Berwick, Barach. *Annals of Internal Medicine*, 2005
Hospital facility systems can impact 8%-10% of serious preventable adverse events

<table>
<thead>
<tr>
<th>Type of Sentinel Event</th>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wrong-site surgery</td>
<td>691</td>
<td>13.3%</td>
</tr>
<tr>
<td>Suicide</td>
<td>641</td>
<td>12.3%</td>
</tr>
<tr>
<td>OP/post-op complication</td>
<td>598</td>
<td>11.5%</td>
</tr>
<tr>
<td>Medication error</td>
<td>470</td>
<td>9.0%</td>
</tr>
<tr>
<td>Delay in treatment</td>
<td>390</td>
<td>7.5%</td>
</tr>
<tr>
<td>Patient fall</td>
<td>307</td>
<td>5.9%</td>
</tr>
<tr>
<td>Assault/rape/homicide</td>
<td>198</td>
<td>3.3%</td>
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<td>Patient death/injury in restraints</td>
<td>183</td>
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<tr>
<td>Unintended retention of foreign body**</td>
<td>175</td>
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<td>Perinatal death/loss of function</td>
<td>159</td>
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</tr>
<tr>
<td>Transfusion error</td>
<td>119</td>
<td>2.3%</td>
</tr>
<tr>
<td>Infection-related event</td>
<td>105</td>
<td>2.0%</td>
</tr>
<tr>
<td>Medical equipment-related</td>
<td>95</td>
<td>1.8%</td>
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<tr>
<td>Anesthesia-related event</td>
<td>84</td>
<td>1.6%</td>
</tr>
<tr>
<td>Patient elopement</td>
<td>82</td>
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<td>Fire</td>
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<td>Infant discharge to wrong family</td>
<td>7</td>
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<tr>
<td>Other less frequent types</td>
<td>652</td>
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Percentage of preventable adverse events in U.S. hospitals resulting in death or permanent loss of function
600 studies show that preventable errors are linked to poor hospital design

- There is a growing body of evidence that now links the physical environment with safety and quality outcomes for patients and staff.
  - 600 studies reported a “credible” link between hospital design to medical errors.¹

- Errors result from physiological and/or psychological limitations of humans
  - Fatigue
  - Workload
  - Cognitive overload
  - Poor communication
  - Imperfect information processing

- Healthcare workers make mistakes because they are human

- Adverse events can result when hospitals have not implemented facility-level systems and processes to protect against human limitations.
Errors occur when an active failure and hazardous latent conditions coincide

• Latent conditions in the facility contribute to active errors to produce error.²,³

• It takes 4.5 errors for a medical error or preventable adverse event to result.⁷

Preventable incidents are usually an indicator of “missing” systems of checks and balances--or failure to adhere to systems that would ordinarily catch or prevent errors
Possible approaches to make the facility safer for patients and staff

- Raise the level of staff attention/focus on potential sources of errors/adverse events with leadership focus

- Develop manual procedures to prevent individual errors – and audits to ensure compliance

- Perform root cause analysis and development of systematic approaches to avoid errors

- Implement automated facility systems that accomplish both error prevention and alerts to enforce compliance (base them on the model of care, organizational processes, and environmental stressors in a systems approach)
Designing defenses into the facility reduces errors.

- Hospital error reduction is achieved by strategically building defenses, barriers, and safeguards into the facility and technology.⁴,⁵,⁶

- Whenever possible, it makes sense to implement automated systems to minimize error that results from failure to adhere to protocols.

Anyone using this teapot design is likely to be burned

<table>
<thead>
<tr>
<th>Latent errors in design</th>
<th>Active defenses in design</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Rear view camera</td>
<td>• Anti-bump reverse parking sensors</td>
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Integrate patient safety defenses into your facility systems to reduce errors

- With expertise and system solutions, you can make your existing facility safer.

- With Design for Patient Safety, better defenses can be integrated in the new hospital design to compensate for human limitations.

- Additional intelligent safety defenses in building systems can help reduce preventable adverse events.

Here’s where we can help

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Examples

● Infection Control

● Utility safeguards

● Violence prevention

● Patient protection
Effective Infection Control depends on controlling the environment and reducing human error

Reduce Airborne Infections
- Ensure that building automation systems conform to prescribed conditions/standards.
- Real-time monitoring 24/7, correction, and maintenance to ensure:
  - Humidity stays at 30-60% to prevent mold, fungi, bacteria
  - Dust (contaminants ventilated out of the room)
  - Ensure correct positive/negative pressure needs
  - Air changes in the room and laminar flow meet standards
  - Automated monitoring to change HEPA filters

Reduce Infections Spread by Contact
- Increase hand washing for clinicians and food service staff (electronic hand hygiene monitoring and reports of results drive compliance by peer pressure)
- Surfaces such as light switches are part of the problem (passive infrared light switching and copper/silver surfaces)
Infection Control: Here’s what we’ve learned from past projects

● Challenge: Ensure that the environment meets standards required to prevent infection without adding maintenance personnel.

● Situation:
  ● It’s difficult for a hospital to maintain the correct number of air changes according to standard, humidity levels, and pressure differentials 24 hours a day, 365 days a year.
  
  ● Maintenance doesn’t have enough time to check pressure differentials and to change filters only when needed.

● Solution: Build intelligence into the system to optimize patient safety and maintenance.

● Results:
  ● Hospital will stay within “safe” environmental standards continuously, reducing airborne infections. (e.g. reacts quickly when humidity drops below 30% during dry winter months)
  
  ● Maintenance saves labor hours and saves material costs (filters changed only when needed)
  
  ● Peace of mind – system is automatic
Ensure that backup generators are fully operational when needed with automated systems

- Utility failures are expensive and lead to fatalities
  - People die (respirators, dialysis, intensive care, people on the operating table..)
  - A 6 hour power failure costs a 200 bed hospital $1 million+ (must bring in extra nurses, bring in sterilized water, flashlights. Ambulances are diverted and operations rescheduled)\(^1\)
  - When people die, there is often litigation (e.g. New Orleans hospital, Paris hospital)

- The root cause is often human error.
  - Busy facilities staff sometimes don’t have time to adequately test power systems.
  - Failure to connect new or relocated equipment to backup power is a common problem.

- Automatically generates test documentation to meet regulators requirements

- Automation can counteract and prevent human error
  - Regulators require documentation of monthly checks of the power system. (we make it simple)
  - Our systems automatically check and test the backup generators every month to ensure they are fully operational.
Ensure Operating Theater maintain power, temperature and humidity

Our solution offers an optimal level of safety and comfort for both medical personnel and maintenance personnel. Everyone can concentrate on their jobs and optimise their work.

The nurse
- Tests the insulation monitoring system at start-up of the operating room.
- Is notified of an electrical fault or insulation fault.
- Uses the Megallets touch screen panel to monitor the environment.
- Is notified of any work performed by maintenance personnel.
- Generates an insulation test.

The surgeon
- Nurse concentrated on what is essential. High patient.
- Benefits from the stability and security of the electrical power supply.

The maintenance personnel
- Is notified by SMS message of the presence of an electrical fault in an operating room.
- Consults via its PC the electrical state of each operating room.
- Performs analysis on the electrical state of each fault.
- Can indicate the handling of the fault.

The supervision personnel
- Views the status of each operating room on its PC.
- Generates event reports.
- Sets alarm thresholds for the temperature and relative humidity values of operating rooms.

Our power distribution and monitoring solution consists of:
- a switchboard,
- a monitoring system,
- an uninterruptible power supply.

- Real-time information for decision-making and action
- Traceability of event
- Monitoring of each operating room
- Continuity of service for patient safety
Case studies: Backup power

- **Automatic power system testing and documentation (60+ hospitals)**
  - Automated documentation for regulatory bodies to prove testing every month
  - Less labor. And less likely to forget/get overloaded and miss tests
  - Hospital has not experienced any interruptions due to power failures since the system was installed.

- **Power reliability systems architecture**
  - Provided expertise to divide the hospital into three levels of priority for critical power during an outage
  - Help ensure that critical hospital areas would be powered first during a utility failure

**St. John’s Hospital Springfield, IL USA 730 beds**

**St. Joseph’s Hospital Marseille, France**
Intelligent defenses improve patient security

- Infant abductions are rare but tragic

- When a patient elopes, the hospital is responsible.

- More intelligent systems can reduce the risk that hospital security systems will be defeated.
Automated defenses reduce the probability of violence

- Incidence of violence is common in hospitals because of high stress levels. Although most think “it won’t happen to me”, it strikes unexpectedly because even “normal” people are under stress in a hospital behave differently.
  - Patient violence (assault, homicide, rape)
  - Nurse/staff assault

- The impact is far reaching:
  - Patient and staff harm
  - Physician/nursing staff complaints
  - Negative media coverage
  - Potential litigation

- Automated defenses reduce the probability of violence
  - Access control
  - CCTV monitoring
  - Alarms, panic buttons, RF monitoring
  - Staff training
  - Security staff

- Additional benefits with integration such as:
  - Monitoring from a common dashboard
  - Additional benefits such as energy efficiency (unused rooms) and automated maintenance management
Here’s what we’ve learned from past projects

Royal Children’s Hospital Melbourne, Australia 250 beds

- Access Control & Intruder Detection System
- Smartcard, E-purse, Patient Information, Car Park
- Closed Circuit Television (CCTV) System
- Video Analytics
- CCTV Head End Equipment
- Combined ACID & CCTV Workstation(s)
- MATV
- TCP/IP Based Intercommunications System
- Electronic Key Management System
- Certified Cat 6 Security Structured Cabling System
- TCP/IP Security Communications Network
- Integration of Security Sub Systems
- Visitor Management System & Photo Identification System
- Patient Wandering
- Baby Tagging

Results

- A safe comfortable environment unobtrusive for children and their families with no major incidents

- Intelligent defenses improve patient safety
  - Infant abduction improvements with tight coordination between CCTV, access control, infant tagging, and photo identification system.
  - Patient elopement improvement, especially for teens who might leave without discharge.
  - Reduce the risk of violence beginning with integrated visitor management, photo identification, and tightly linked access control

- Additional benefits
  - Convenience to use Smart card/E-purse for access
  - Energy efficiency and maintenance improvements with BMS integration
Building systems for patient safety provide additional benefits

- Prevent electrical fires
  - 10% of hospital fires are caused by electrical and lighting systems

- Avoid electrical injuries
  - 7% of electrical injuries occur in health care

- Lighting for patient healing
  - Advanced lighting control systems for better patient healing
  - Reduce the risk of errors caused when lighting levels are low

- Patient fall monitoring integration
  - Integration with nurse call and bed monitoring solutions

- Provide improved patient experience
  - Bedside computers for clinicians, patient involvement in care, entertainment, and room control
Patient Satisfaction
Patient control of room comfort

● Value proposition
  ● We help you increase patient satisfaction, reduce patient stress/improve healing, and improve staff productivity by giving patients more control of their patient room environment.

● Enable the patient to:
  ● Adjust room temperature
  ● Turn on/off lights
  ● Open/close shades

● Easily connect:
  ● iPOD
  ● Mobile phone
  ● PC
  ● Control TV
Patient safe hospital rooms

- Integration of:
  - Standardized room configuration
  - Nurse call
  - Fall prevention / intelligent bed
  - IP telephones (panic buttons and CPOE)
  - Electronic Health records integrated with nurse call and room/flow control.
  - Bed side computer (patient involvement in health + entertainment)
  - Patient-controller room (lighting, temperature, entertainment)
Designing the Hospital of the Future
Trends

● Design for Patient Safety

● Green Design

● Design for Patient Satisfaction

● Design for Energy Efficiency
Integrated systems are needed to achieve new hospital construction goals

New Hospital Design Goals: Green  Safe  Efficient  Patient Satisfaction

Intelligent Building systems  Power  BMS  Security  Fire  Patient room systems
Hospital integrated IP network
Before A Converged Solution
A Converged Solution
Trend: Integrated intelligent systems

- Convergence of Power, BMS, Security, and IT
  - Driven by Energy Efficiency (Intelligent Energy)
  - Driven by Patient safety (active safeguards to prevent adverse events)

- Examples
  - Intelligent Green Grid: distributed generation and peak load management
  - Plug n’ play power meters
  - Monitoring and Alarms for maintenance or malfunction of all facility and security systems in one place (e.g. data center power, cameras, air handling, low voltage equipment....)
  - Regulatory compliance: storing data in one place
Benefits of integrated systems

- **Construction phase**
  - Reduced installation through the use of common networks and structure cabling (Common Infrastructure).
  - Elimination of system hardware duplication and inter system hardwiring.
  - Serial interfaces reduce point to point wiring.
  - One implementation team for all system.
  - Reduce co-ordination problems during installation.
  - Reduce the number of interface dependencies using common open protocols.

- **Operation phase**
  - One system for operators to learn (fewer front end systems).
  - Reduced preventative maintenance requirement and less wasted call outs.
  - Services operate more efficiently using less energy.
  - Future technological developments can be incorporated more easily and economically (common infrastructure).
Opportunities to reduce ongoing operational costs are greatest in the predesign stage\(^1\)
Efficient hospital specification is lost in the today’s construction process
The Building Process

Energy Management: Electrical + Control Technology

- Disconnect between Key Financial Stakeholders and Technology Providers
  - Contractual relationships are formalised between the Construction Manager and the Integrators/Installers
  - Limited direct technical input by technology providers once these contracts are established

- Result
  - Technology capability not fully built-in
  - Technology configuration not fully aligned
  - Increased time to resolve issues
  - Limited access to technology specialists
  - Full impact of ongoing changes missed
Design for Energy Efficiency

A 250 bed hospital *wastes* 20-30 M€ over 30 years due to sub-optimized design/integration and monitoring

**Optimized integrated systems**
- Measurement / submetering
- Single energy dashboard (trends, cost/patient day)
- Optimized HVAC
- Lighting control
- Optimized power factor
- Optimized plant and power systems
- Efficient data center / IT

**Passive energy efficiency**
- Lamps
- Windows
- Insulation
- Variable speed drives

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Missed opportunities for a Better hospital

● Design for patient safety
  ● Infection control
  ● Humidity / air change monitoring

● Green / Energy efficiency hospital
  ● Single energy dashboard
  ● CO2 monitoring

● Reduced Maintenance
  ● Filter change

● Cleaner, healthier hospital environment

● Patient satisfaction => systems often not connected
  ● Give the patient control
Possibilities

Reduce long-term Energy & Maintenance Costs

Possibilities

Hospital strongly specifies and energy efficient & low maintenance building

Contract a vendor to add functionality to the systems after construction

Add functionality with existing hospital facilities staff

Improve Facilities dept execution for energy efficiency

Impact

• Efficient building spec gets lost in “value engineering” at the end of the process
• Efficient design is not used/maintained

A very expensive redesign since efficiency crosses BMS, Power, Power meters, security, IT…..

Hospital facilities is overloaded and doesn't have the expertise to redesign

It's more difficult to maintain behavior changes than to automate efficiency in the base systems.

• Ensure you get the efficient design you specify
• Ensure the efficiency is used and doesn’t decay

Schneider Electric Technology Coordinator
Solution

Technology Project Coordinator

- Put the Schneider Electric Technology Project Coordinator on the core design team
- Design an integrated energy efficient and low maintenance hospital building
- Improved Design and Integration Risk Management and Alignment
- Prompt access to Technology Specialists
Get your Technology Coordinator involved early in the new construction process

Business Requirements
Lead the Design Process

1. Functional requirements
2. Schematic Design (layout)
   - Core Design team
3. Design development (detail)
   - Criteria sheets (checklists)
   - BMS, lighting, etc.
4. Construction documents
   - Architect
   - Design Engineers
5. Contractor Bid
6. Subcontractor Bid
7. Vendors

-3 years
-2.5 years
-2 years
-1.5 years
-1 year
-6 months

Construction Start

People involved

- Business and functional requirements
  - CEO
  - CFO
  - VP Support Services
- Planning & Design Phase
  - Hospital Construction Project Leader
  - Architect
  - Mechanical and electrical design firms/engineers
  - Large Design-Build Construction Contractor (EPC)
  - General contractor
    - Mechanical contractor
    - Electrical contractor
    - Plumbing contractor
    - IT contractor
  - Functional users and needs
    - Charge nurse
    - Physician representative
    - Infection control professional (infection control risk assessment)
  - Project sponsor
  - Facilities Manager
  - Medical equipment planner
  - Director of Information Technology

We need to be here

Today we are here

Keep these people involved
Proven Success
Royal Children’s Hospital – Melbourne, Australia

- HVAC & Central plant control
- Lighting control
- Smoke damper actuators
- Displays for operating theaters
- Facility management software
- Fire system monitoring
- Interface to Food Service, Transportation, Drug repository

- Access control & intruder
- CCTV and video analytics
- Baby tagging
- Patient wandering
- Nurse duress / panic button
- Smart card, E-purse, Patient information
- Car park
- Visitor management system

- Load shedding
- Power meters
- Automated generator testing
- LV / MV electrical distribution

Integrated Energy Monitoring & Control

Building Management
Power Management
Security Management
VSD Drives
IT Infrastructure

- Certified Cat 6 structured cabling system
- TCP/IP security network
- TCP/IP intercom system
Proven Success
Quiron Hospital, Madrid Spain

Performance assurance services ensures that all of the Energy savings integrated intelligence designed in the system is fully used and maintained.
The Future of Hospital Facilities Design

IHEA Meeting
28 April 2010
Sydney, Australia