Evolution of Smart Buildings and Their Place in the Internet of Everything

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ICEBO 2014 China
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BSRIA is.....?

What?
Member based Association
Since 1955

How?
Consultancy services
Test Instruments
Publications
Training
Information
Research

Why?
To help industry and clients be more efficient and effective

For whom?
Owner/Operators
Specifiers
Manufacturers
Contractors
Trends for Smart Buildings
Technologies are already Interacting…

Smart Cities

Smart Buildings

Smart Devices / Appliances

Data Communications

Energy
Smart City

Broadband connectivity, Knowledge workforce, Innovation, Digital inclusion...

Smart Building

Information and Communications Technology, Passive design, Energy & Water efficiency, On-site renewables, Controls & Lighting, Monitoring and Management...

Smart Grid

Bi-directional flows of energy, 2-way communications, remote control/automation of power, integrated distributed energy, energy storage...
Smart Grid

**YESTERDAY: TRADITIONAL**

- Centralised generation
- Monodirectional power flow
- Centralised and limited control
- Manual restoration of failures
- Fixed fares

**TOMORROW: SMART**

- Decentralised generation
- Bidirectional power flow (T&D)
- Decentralised and multilevel control (knots)
- Failure prevention and self-healing concept
- Variable fares

Source: Prysmian Group
Smart Buildings

Integration with the Smart Grid

Connecting to Smart Cities
Home Automation Evolution

- **1970**: "SMART" HOME
- **2010**: "CONNECTED" HOME
- **2017**: "UBIQUITOUS" HOME
- **2025**: AMBIENT INTELLIGENCE + INTERNET + HOME AUTOMATION
System Integration
The Challenge of Software and the Cloud

Big Buildings - Big Data
Advanced Analytics
The Cloud: Universal Access

Major opportunities for IT companies which combine these
The Information Dimension

- 18 month payback
- 500 million data elements daily
- 10% energy savings
- 48% faults detected in <60 secs.

750 Air Handling Units
125 buildings
4 million per building
58,000 employees
When?

- 2015: LEDS
- 2020: Distributed Energy: Generation and Storage
- 2025: Dynamic Energy Pricing
- 2030: Cyber-security for Building Systems

Building Energy Management: Systems - Services - Analytics
Who is best placed to Lead the ‘Smart New World’?

<table>
<thead>
<tr>
<th>Breadth of Competency</th>
<th>Breadth of Services</th>
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<td>Narrow</td>
<td>Wide</td>
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Smart Reach

**Potential Leaders**
- Microsoft
- Google

**Leaders**
- IBM
- Schneider Electric
- Siemens
- Honeywell
- Johnson Controls

**Excellence in Market Intelligence**

Proceedings of the 14th International Conference for Enhanced Building Operations, Beijing, China, September 14-17, 2014
More than 75% of Buildings have no Intelligent Controls

1961-1990 44%
1991-2010 15%
Before 1960 41%
150-300 sensors and actuators
Towards the Information-based Building

“How can I manage my buildings to provide a safe, secure, comfortable and productive environment as cost-effectively as possible?”
New Skills Needed