High Performance Buildings Workshop

Retrofits for Productive and Sustainable Buildings

September 16, 2015 ● Toronto, ON

Intelligent Buildings: The Past and the Future

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www.CABA.org

LinkedIn: http://www.linkedin.com/groups?gid=2121884

Presentation Summary

1. Overview of CABA
2. Intelligent Buildings Description
3. Market Sizing, Characteristics and Trends
4. Green and Zero Net Energy Buildings
5. Smart Grid and Buildings
6. Life Cycle Costing and Intelligent Buildings
7. Intelligent Buildings and Big Data
8. Cybersecurity Issues
9. IoT and Intelligent Buildings
10. Trends and Drivers
11. Summary and Future
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About CABA

The Continental Automated Buildings Association (CABA) is an international not-for profit industry association dedicated to the advancement of connected home and building technologies. The organization is supported by an international membership of over 325 organizations involved in the design, manufacturing, installation and retailing of products relating to home automation and building automation.

www.CABA.org

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CABA Board of Directors

CABA Vision Statement

"CABA accelerates growth in the connected home and intelligent buildings sectors."

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Smart Buildings
Networked. Intelligent. Adaptable.

Source: Intel Corporation, CABA Board Member

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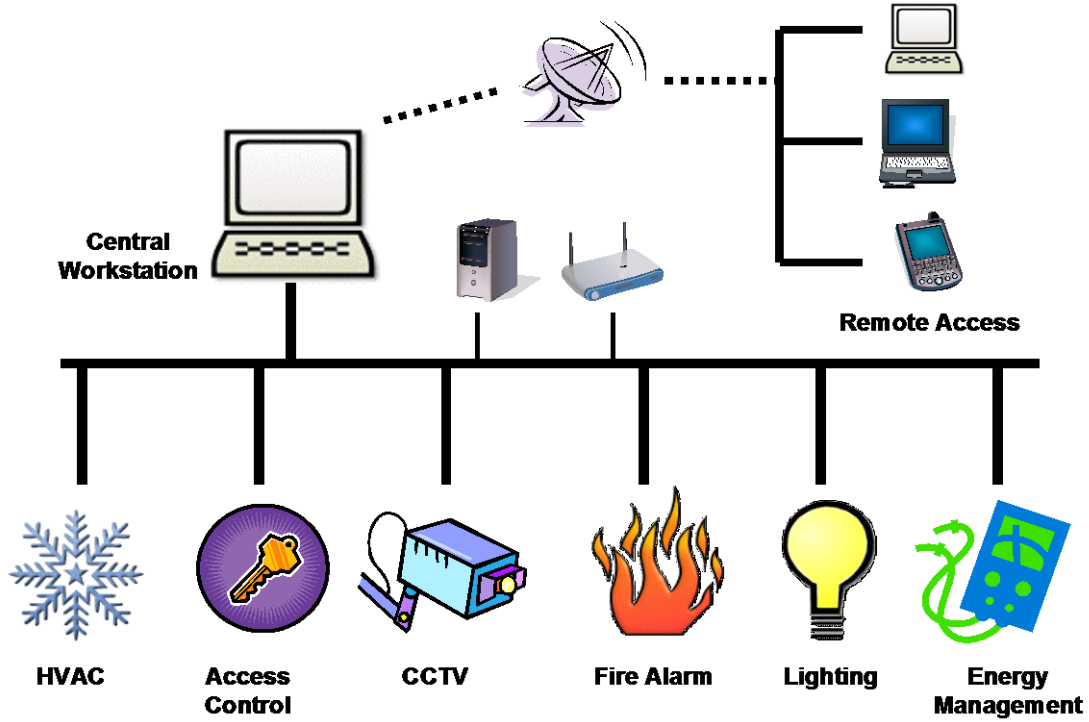
The Architecture of Latest Building Automation System (BAS)



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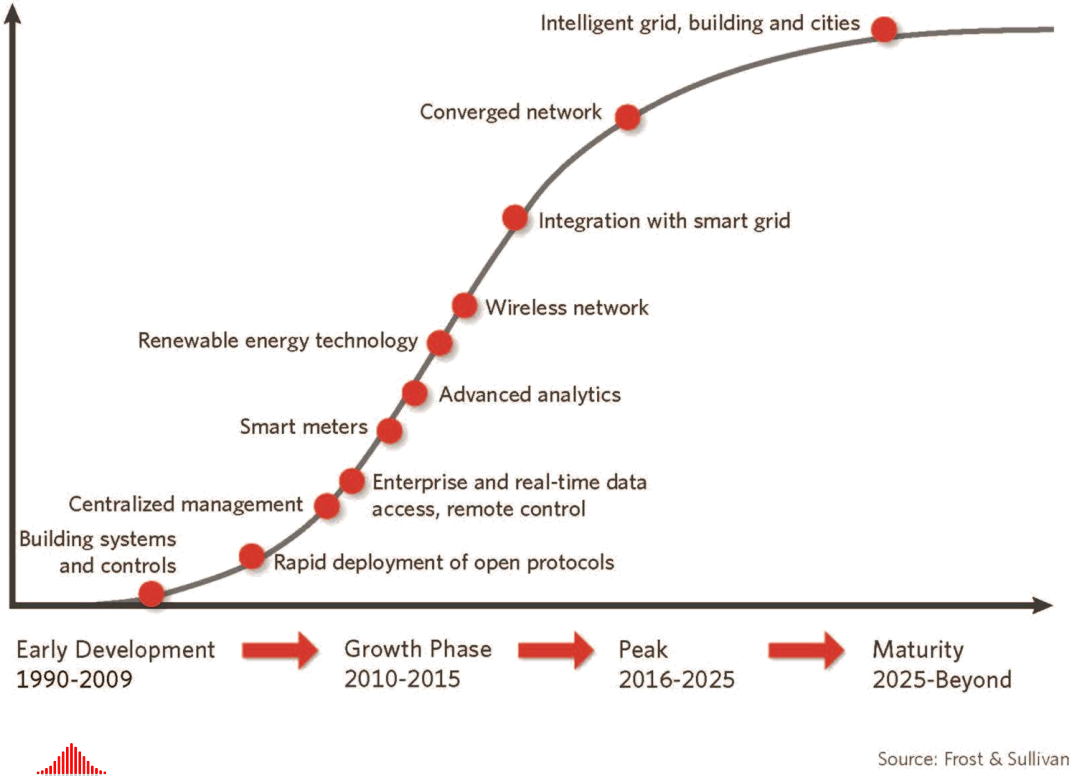
Source: CABA Intelligent Buildings Market Sizing for North America Report

Intelligent Building Solutions Market Life Cycle Analysis



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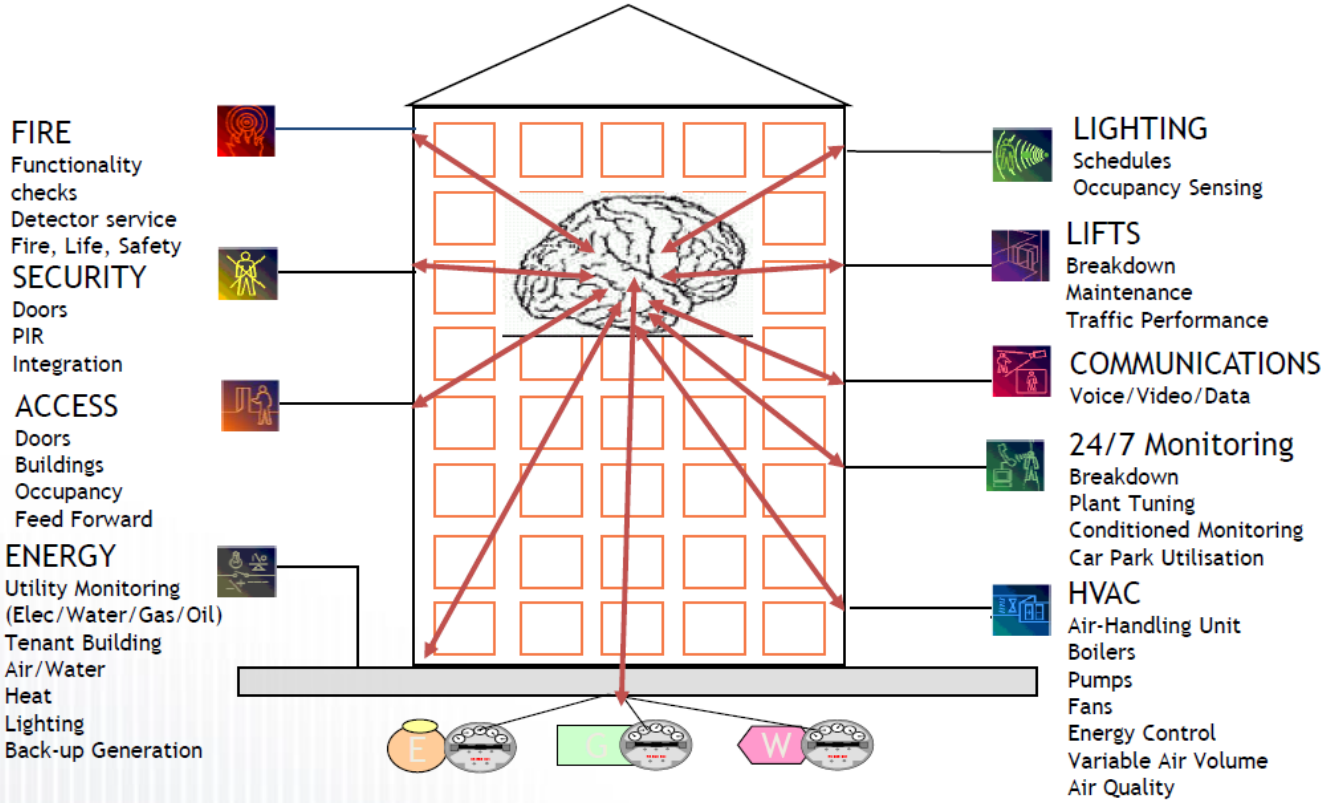
CABA RESEARCH PROGRAM

Source: CABA's North American Intelligent Buildings Roadmap 2011

In other words....



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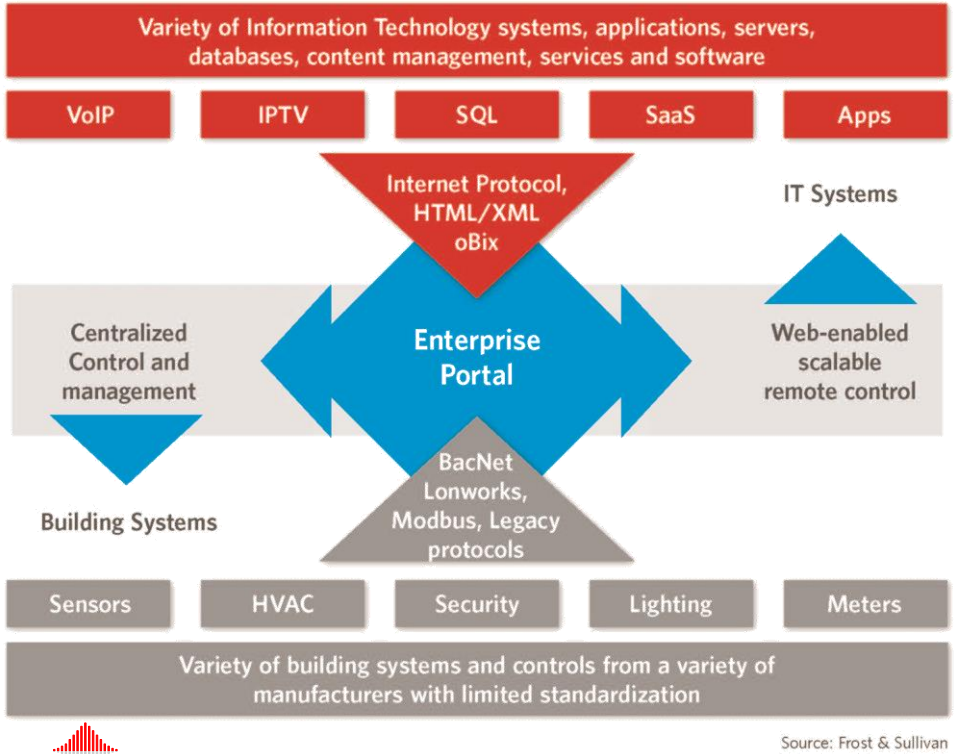
Enterprise Convergence Platform for Building Systems and IT Systems



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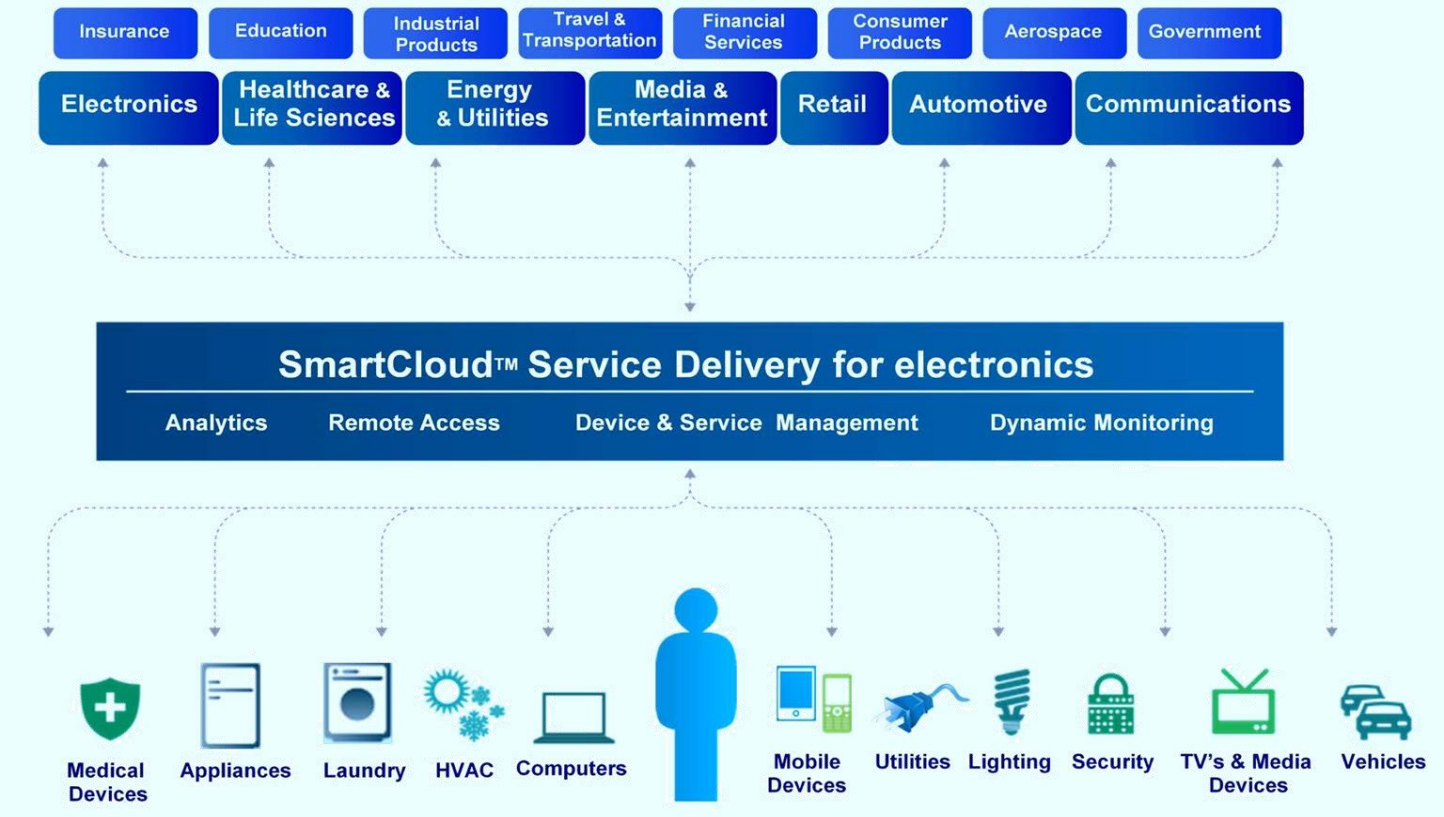
CABA RESEARCH PROGRAM

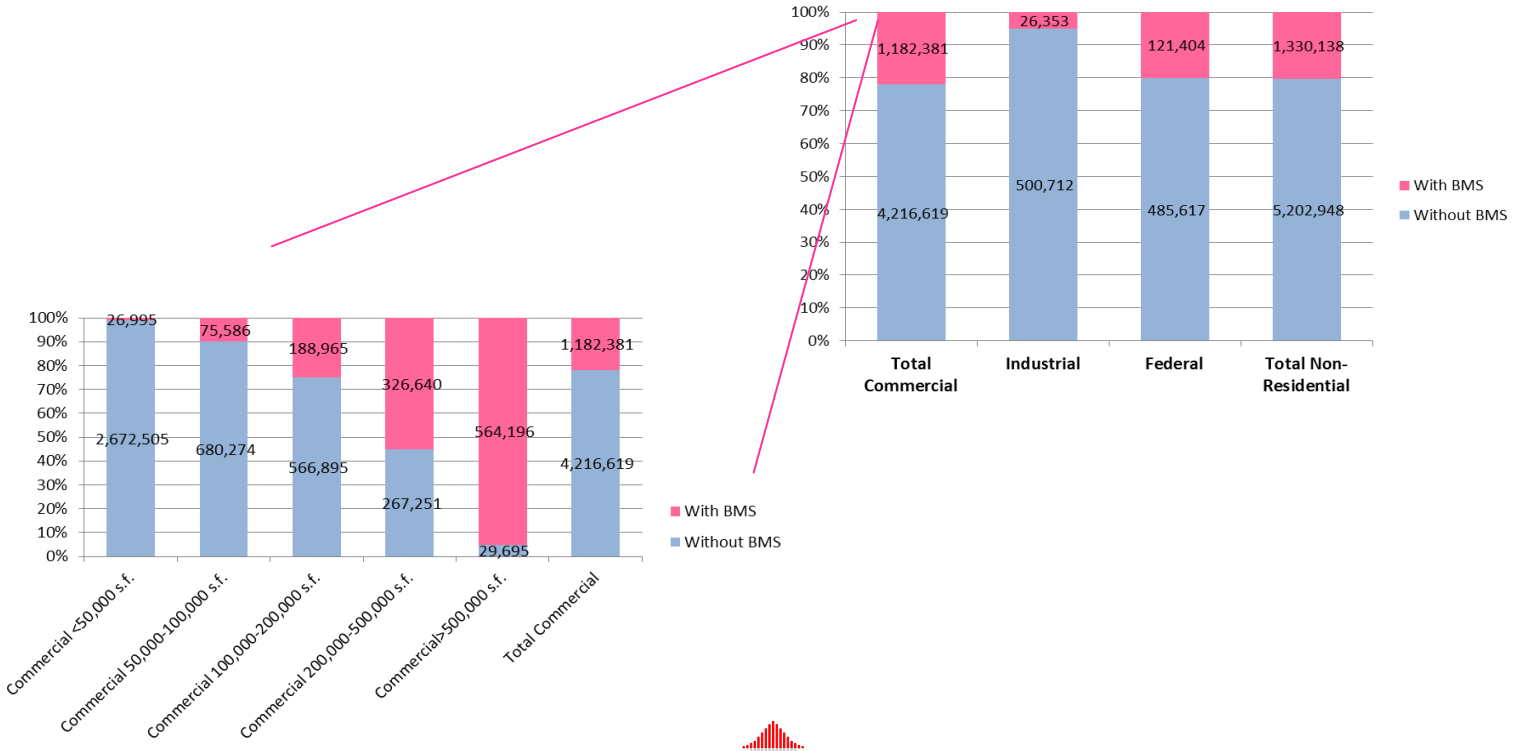
Source: CABA's North American Intelligent Buildings Roadmap 2011

Cloud Technology



Source: IBM

BMS Penetration by Number of Buildings – by Commercial Building Size Category



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Source: CABA's Smart Grid Impact on Intelligent Buildings

Characteristics and Trends

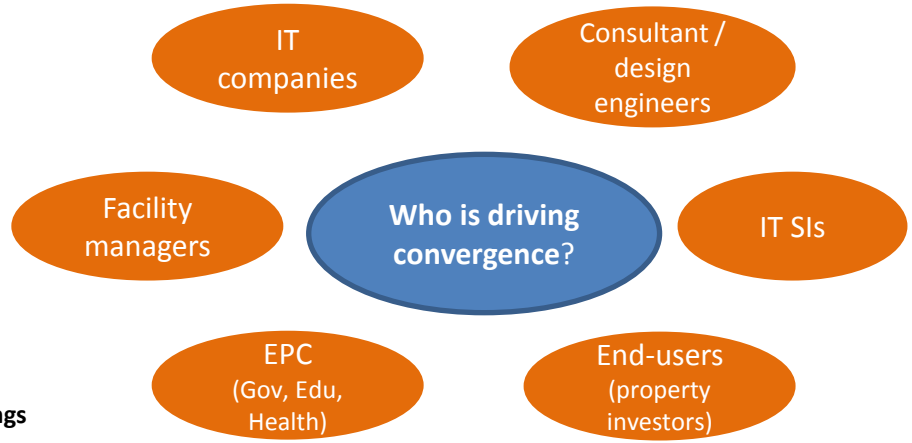
Verticals

- Higher education
- Healthcare, mainly hospitals
- Governmental buildings
- Transport (airports)
- Offices
- Sports Stadiums
- Life science/pharmaceutical industry
- High tech/precision manufacturing

- New build and major refurbishment

Trends

- Remote access to data (needs to be IP) - Could be Cloud based
- Cheaper sensors, processors and available application software
- Possibility of generation data from M2M/IoE
- PoE platform – Low voltage lighting systems and sensors
- Uptake of wireless protocols
- Increasing use of software packages



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Source: Market Sizing for North America – Intelligent Buildings

Convergence Intelligent and Green

www.frost.com

FROST & SULLIVAN

www.caba.org/brightgreen

www.CABA.org/brightgreen

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Source: CABA's Convergence of Green and Intelligent Buildings Report

CABA Zero Net Energy: Building Intelligent Controls Driving Success

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BC hydro
CGA Canadian Gas Association Association canadienne du gaz
ComEd An Exelon Company
Cu Copper Development Association Inc.
Merge Alliance
Enbridge Life Takes Energy
enocean alliance
Honeywell
Hydro Québec
Integral Group
MechoSystems Design with light.
nbi new buildings institute
NREL National Renewable Energy Laboratory
New York State of Opportunity. NYSERDA Sponsored
Schneider Electric
SIEMENS
somfy
Union Gas A Spectra Energy Company

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More information can be found at:
http://www.caba.org/CABA/Research/Zero-Net-Energy-Buildings.aspx

Smart Buildings for a Smart Grid Video by Cisco

Source: Cisco Systems

Life Cycle Costing Of Intelligent Buildings

CABA Landmark Research Study

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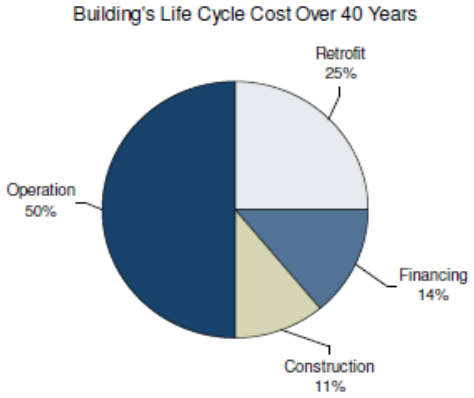
For a Complimentary Research Report, go to:
http://www.caba.org/lccib

Life Cycle Cost

www.frost.com

Why will intelligent technologies cost less than traditional technologies?



Source: ASHRAE

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www.caba.org/brightgreen

http://www.caba.org/brightgreen

CABA RESEARCH PROGRAM

Source: CABA's Convergence of Green and Intelligent Buildings Report

CABA Intelligent Buildings and Big Data

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Defining Big Data in Intelligent Buildings

- Big data in intelligent buildings is defined as:
  - *The next generation in business and operational intelligence derived from the analysis of data integrated across multiple streams or sources for the purposes of overall system understanding, performance, and optimization*

- The term big data encompasses both the solution architecture and associated analytics

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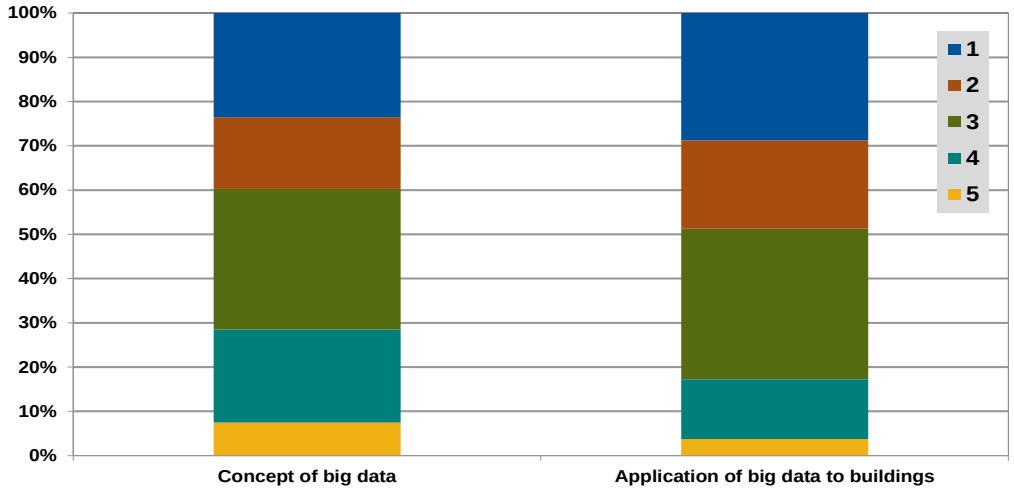
Source: CABA Intelligent Buildings and Big Data 2015

Survey Findings

- Most decision makers do not know how to define big data or understand the potential benefits

On a scale of 1 to 5, where 1 is not knowledgeable at all and 5 is extremely knowledgeable, how do you rate your knowledge about the concept of big data and the application of big data to buildings? (n=400)



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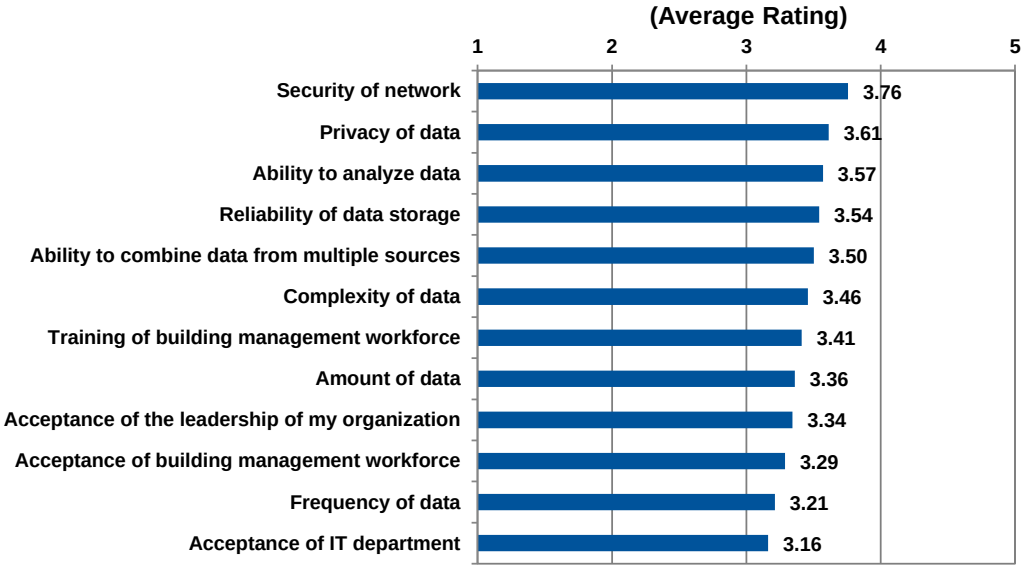
Source: CABA Intelligent Buildings and Big Data 2015

Survey Findings

- Security and privacy are the biggest issues

On a scale of 1 to 5, where 1 is not knowledgeable at all and 5 is extremely knowledgeable, how do you rate your knowledge about the concept of big data and the application of big data to buildings? (n=400)



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Source: CABA Intelligent Buildings and Big Data 2015

Major Findings

- There is a lot of low-hanging fruit in building and operational improvements – many customers can still benefit from periodic reporting and analytics on existing building systems, and, as a result, many customers are not ready to adopt fully integrated big data solutions.

- Those interested in big data require transparency in the ROI of building and operational improvements.

- Big data in intelligent buildings represents a pinnacle in energy and operational management.

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Source: CABA Intelligent Buildings and Big Data 2015

Major Findings

- Chasm between the technology and end-user readiness for big data in intelligent buildings.
- The majority of decision makers in the intelligent buildings market do not know how to define big data or understand the potential benefits of these new solutions.
- Data security is a major concern for customers, and technology providers have an opportunity to demonstrate how standards and procedures can protect businesses investing in big data solutions.

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Source: CABA Intelligent Buildings and Big Data 2015

1) New CABA Landmark Research “Intelligent Buildings and Cybersecurity”

http://www.caba.org/intelligentbuildingcybersecurity/

2) New CABA Landmark Research “Cybersecurity and the Connected Home”

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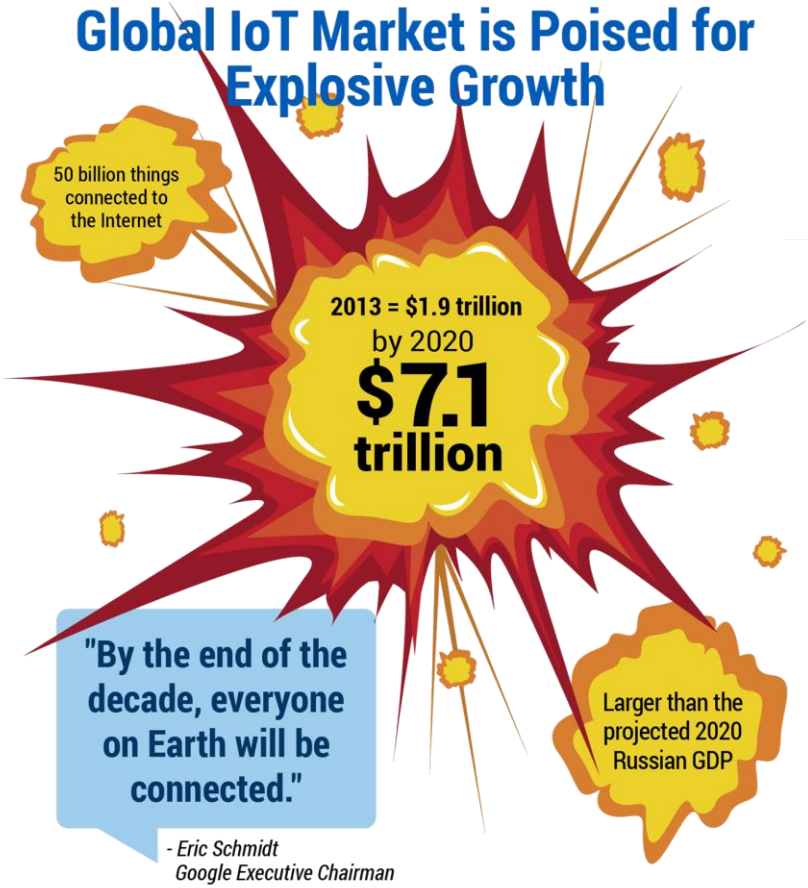
http://www.caba.org/homecybersecurity

Global IoT Market is Poised for Explosive Growth



How many "things," including your body, can you communicate with through a device? And will a smartwatch become more like a wearable woven into your garments, contact lenses or implanted into your body?

Whatever the eventual device, it is manufacturers that play a lead role in translating technologies into new products for tomorrow

Source: Jabil, www.jabil.com

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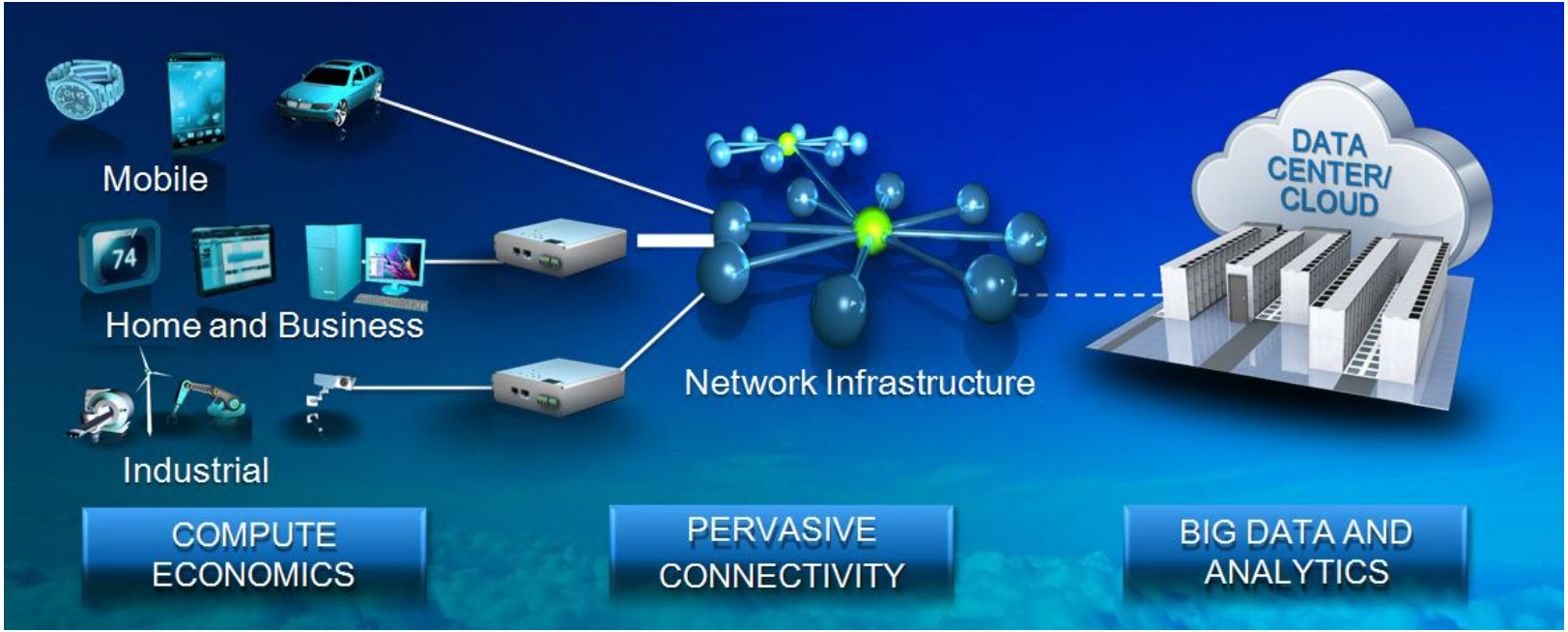
Internet of Things

Devices that are connected to the internet, integrating greater computer capabilities, and using data analytics to extract meaningful information.



Source: Intel Corporation, CABA Board Member

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“Internet of Things” Principles

Source: Intel Corporation, CABA Board Member

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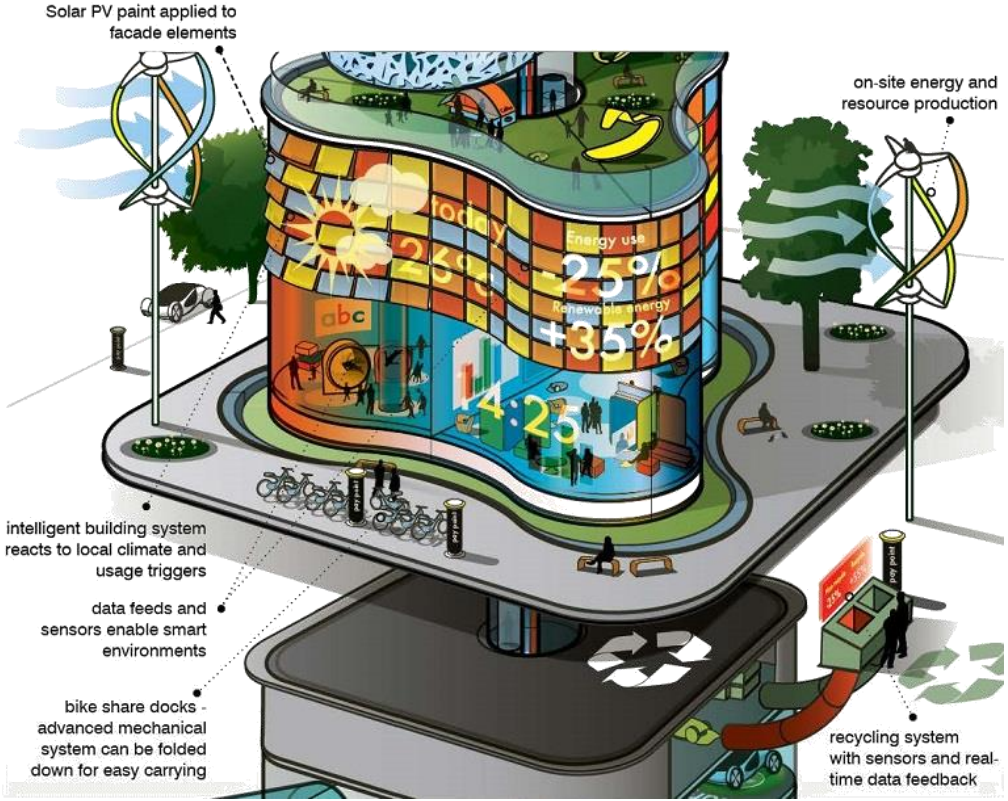
Smart Systems – The Building of the Future

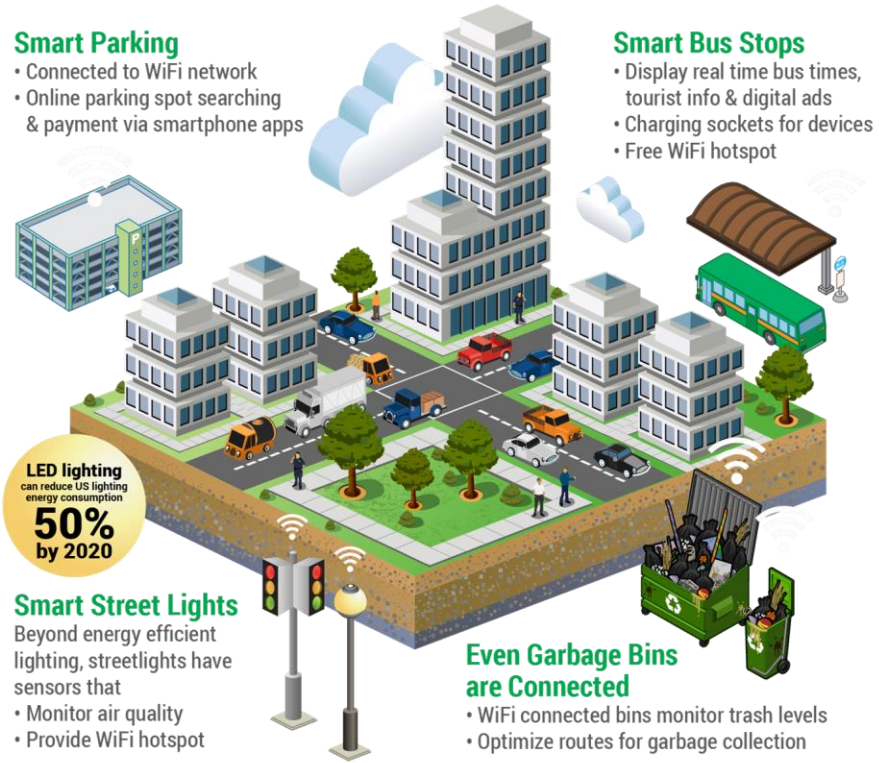


Source: Arup Foresight

SMART CITIES

What's a Smart City?

A city-wide network of sensors provides real-time valuable information on the flow of citizens, noise and other forms of environmental pollution, as well as traffic and weather conditions



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Source: Jabil, www.jabil.com

Trends and Drivers

- Uptake of Building Energy Management Systems (BEMS)
- Uptake of energy usage data analytics and ‘Big Data’
- Concerns about energy efficiency
- Legislative requirements (e.g. Indoor Air Quality Standard)
- Uptake of ‘Internet of Things’
- Cybersecurity
- Connectivity and interoperability between BACS and other systems
- Impact of Automated Demand Response (ADR)

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CABA Improving Organizational Productivity And Building Automation Systems

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National Research Council Canada

Conseil national de recherches Canada

Schneider Electric

United Technologies Building & Industrial Systems

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More information can be found at:
http://www.caba.org/CABA/Research/NRC-Research-Project.aspx

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