New Technologies

Kristy Shomaker, Trane Greg Merritt, Cree John Morrill, Arlington County (moderator)







Get Connected

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Territory Commercialization Leader



Today's Discussion



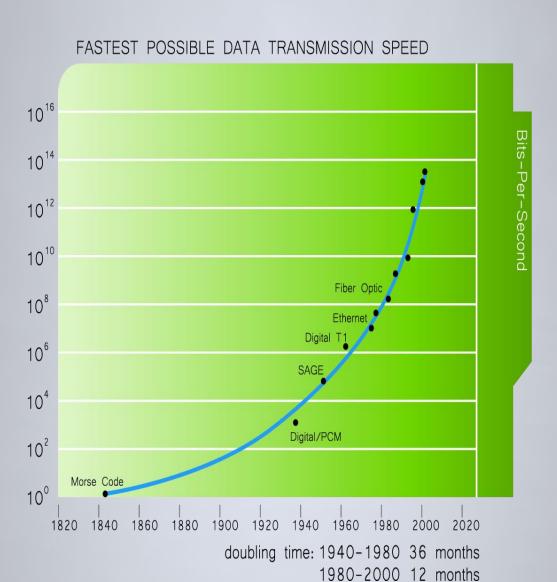
- Key Trends In the midst of change
- Connected Buildings Technology-Enabled Transformation
- Resulting Customer Business Outcomes
- Challenges to Keep in Mind



MACRO TRENDS



We cannot predict the future



WHAT IS A CONNECTED THING?

When physical objects can communicate with each other and the outside world, they are said to be connected things or smart objects: One can interact with them remotely, query how they are doing and change their state as required. In the report, laptops, tablets, desktop computers, ICT infrastructure and mobile phones are excluded from connected things market figures



Connected Vehicle includes machines (regardless of modus, i.e. road, air, rail, water), that transport passengers or cargo



Connected Money includes devices for payment and related services, e.g. vending machines, points-of-sale



Connected People includes humans or living animals, e.g. tracking of people's geographical position, activity and measurement of bio markers



Connected Building includes physical structures used as homes, office or a public facility



Connected Consumer Gadget includes electronic equipment intended for entertainment, communications and/or leisure, e.g. cameras, TVs, white goods, consumer wearables



Connected Industrial Process is defined as part of a larger commercial process e.g. machinery



Connected Infrastructure includes physical objects optimized for public needs or regulatory demands, e.g. energy optimization

People & Gadgets





Alexa is everywhere





Home appliances
TV's
Security
Routers
Locks
Robots
Lighting
Alarm clocks
Vehicles
Smartwatches

- ♣ "Alexa, activate LEAVING HOME"
- ¶ "Alexa, activate WELCOME

 HOME"

- .Alexa, start scene LIGHTS OFF"

Energy efficiency systems

Building Impacts





Facility use changes



Sensor recalibration NOT performed



Alarms NOT set up to support staff



Schedule Override don't get reset



Deferred maintenance

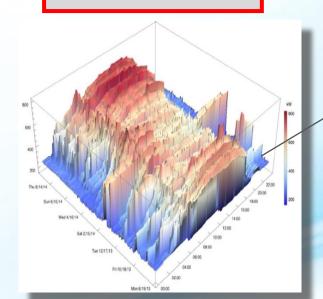


Set-points get permanently changed

Visible insights



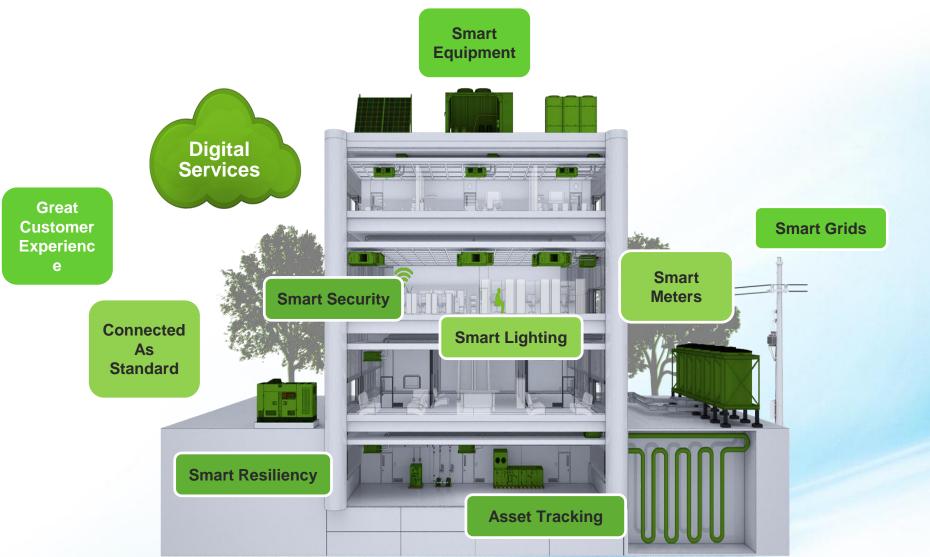
Connected Buildings



What Technologies?

Connected Buildings





Why be Connected?



- Provides improved customer experience
- Offers 24/7 access to system and data
- Enables remote, enterprise-wide system management for better quality/space usage
- Better decision making for improved building performance
- Creates visibility for ongoing energy and operational savings



Case Study: Movie Theater Chain





Challenge

- A movie chain wants to ensure customer comfort while optimizing energy use
- Need real-time, enterprise-wide updates

Approach

- Understanding customer key needs true partnering
- Real-time synchronization with Business Systems
- Integrated lighting and HVAC with building controls

Results

- Energy efficient theaters that keep guests comfortable
- System anticipates occupant load based on ticket sales/show schedules
- Sets temperatures before guests occupy seats
- Energy use and comfort are optimized
- Reduced comfort calls and facility management action requests

Challenges with being Connected



Technology

Fast Changing
Security
Connectivity
Changing Standards
Legacy Systems

People

Expectations changing
Confidence
Education
Collaboration

Business

Investments
Regulations
Legal

Get Connected Strategies



- 1. Explore opportunities and set a strategic direction define where you want to play and how
- 2. Get the right partner(s) to deliver sustainable system solutions
- 3. Recognize and address the challenges associated with emerging technology and security
- 4. Engage key stakeholders (internal and external)
- 5. Smart to start small and build on success







THANK YOU!





NOW is the time to fundamentally CHANGE the way you think about LED lighting.

It is NOT just simple energy savings & code compliant lighting control.

It is a Building Intelligence Platform that delivers value beyond light



Intelligent Lighting as a Platform

Cree is combining smart lighting products with the Internet of Things and innovative applications to create the SmartCast Intelligence Platform...to deliver smart lighting and smart building solutions

Expanding beyond making lighting more efficient to making buildings more efficient and businesses more profitable

Deliver increased value **beyond lighting** to our customers

Build on a foundation of world class simplicity and superior user experience to drive widespread adoption

CREE ♣

Intelligent Lighting as a Platform

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Hardware

- LED lighting products, sensors and communication devices
- High LPW LED combined with basic control
- Better Light

Software



- · Data collection and networking
- Software-driven analytics and decision guidance
- Scalable, dynamic computing
- · Deliver value beyond lighting

Services



Simple installation commissioning



Technical Support



Customer Portal and Community



Software and Security Updates

SIMPLY PUT: Lots of great new technology

Building
Intelligence
Platform that
delivers value
beyond light



SmartCast Advisor Application



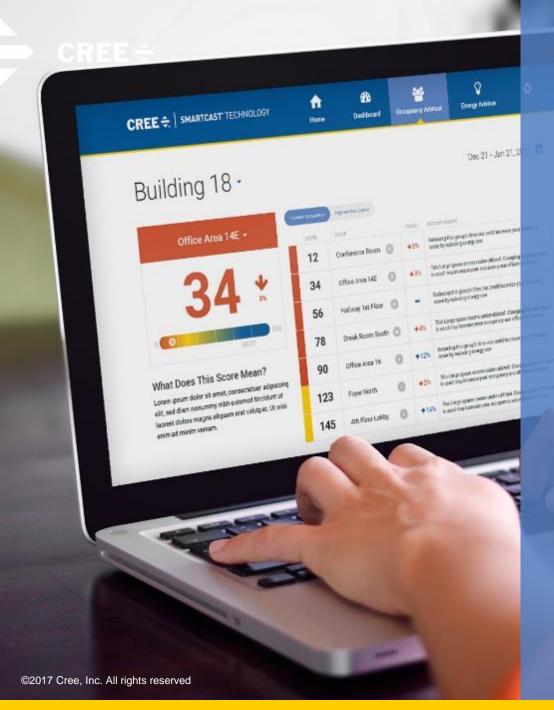
Adjustable CCT Dimmer







SmartCast Startup Services



Building Intelligence Applications

Delivers value beyond light and makes buildings more profitable

Collect, process and analyze data to provide simple and actionable insights

Begin collecting data and driving improvements immediately upon installation













Welcome to SmartCast ® Advisor

Occupancy Advisor

CREE \$ SMARTCAST ADVISOR



Find where to add people without adding space

Energy Advisor



Learn how to reduce your energy spend

Vacancy Finder



Find unoccupied conference rooms

30-DAY QUICK LOOK

OuterBanks

Energy Savings



% OCCUPANCY

POTENTIAL SAVINGS

Dynamic Lighting



Automatically adjust color and output throughout the day

Lighting Control



Adjust light settings to adapt and fit your space

Active Watch



Monitor for suspicious activity everywhere



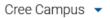








♀ Energy Advisor



Analytics

Dec 30 - Jan 30, 2017 🏥

Your Current Energy Cost

(\$/Kwh/mo)

Savings Potential

(\$/mo)

Insights





Turning on daylight harvesting for light fixtures near windows to optimize efficiency



Changing how floor space is used may decrease your overall energy costs

Leas	t Efficient	Most Efficien	ıt
Kwh AVG	SPACE		TREND
• 32.4	Building 10	(\$)	♦ 8%
• 21.8	Office Area 14E	S	◆ 3%
• 19.6	Hallway 1st Floor	(3)	-
• 19.2	Building 2	M	↓ 4%
• 17.4	Office Area 16	(\$)	↑ 12%
• 14.9	Foyer North	(L)	◆ 2%
• 13.6	Building 8	(L)	↑ 14%
• 13.1	3rd Floor Break Rm	(\$)	↑ 12%
• 12.8	South Entrance	(L)	↓ 2%
• 10.2	Area 51	(\$)	↑ 1%









Energy Heat Map

Building 18 - Floor 4 ▼



Energy Insights

These spaces are using the most energy					
Kwh AVG	SPACE		TREND		
• 32.4	Building 10	(\$)	◆ 8%		
• 21.8	Office Area 14E	(\$)	↓ 3%		
• 19.6	Hallway 1st Floor	(\$)	-		
• 19.2	Building 2	M	↓ 4%		
• 17.4	Office Area 16	(\$)	↑ 12%		
• 14.9	Foyer North	L	↓ 2%		
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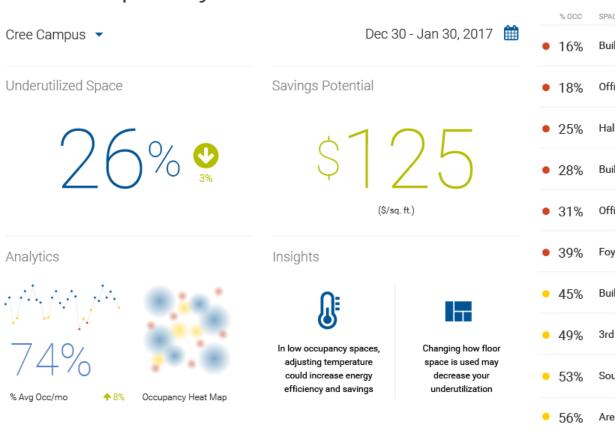








Occupancy Advisor



Leas	t Occupied	Most Occupi	ed
% OCC	SPACE		TREND
• 16%	Building 10	S	◆ 8%
• 18%	Office Area 14E	(\$)	◆ 3%
• 25%	Hallway 1st Floor	S	-
• 28%	Building 2	M	↓ 4%
• 31%	Office Area 16	S	↑ 12%
• 39%	Foyer North	L	◆ 2%
• 45%	Building 8	(L)	↑ 14%
• 49%	3rd Floor Break Rm	n (S)	↑ 12%
• 53%	South Entrance	(L)	◆ 2%
• 56%	Area 51	S	↑ 1%











Occupancy Heat Map

Building 18 - Floor 4 ▼



Occupancy Insights

The	ese spac	ces are the most under	rtilized	
	% 000	SPACE		TREND
•	16%	Building 10	(8)	♦8%
•	18%	Office Area 14E	(6)	◆ 3%
•	25%	Hallway 1st Floor	S	-
•	28%	Building 2	(M)	4 4%
•	31%	Office Area 16	(8)	↑ 12%
•	39%	Foyer North	(L)	♦ 2%
•	45%	Building 8	(L)	↑ 14%
•	49%	3rd Floor Break Rm	(3)	↑ 12%
•	53%	South Entrance	(L)	♦ 2%











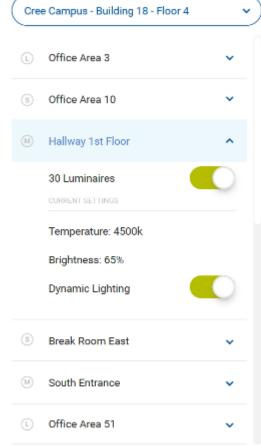




Dynamic Lighting

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New Technologies Questions?

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