Tanuj Mohan, CTO Enlighted

IoT & Big Data: What's Lighting Got to Do with It?

DOE Connected Lighting Workshop, June 8, 2016

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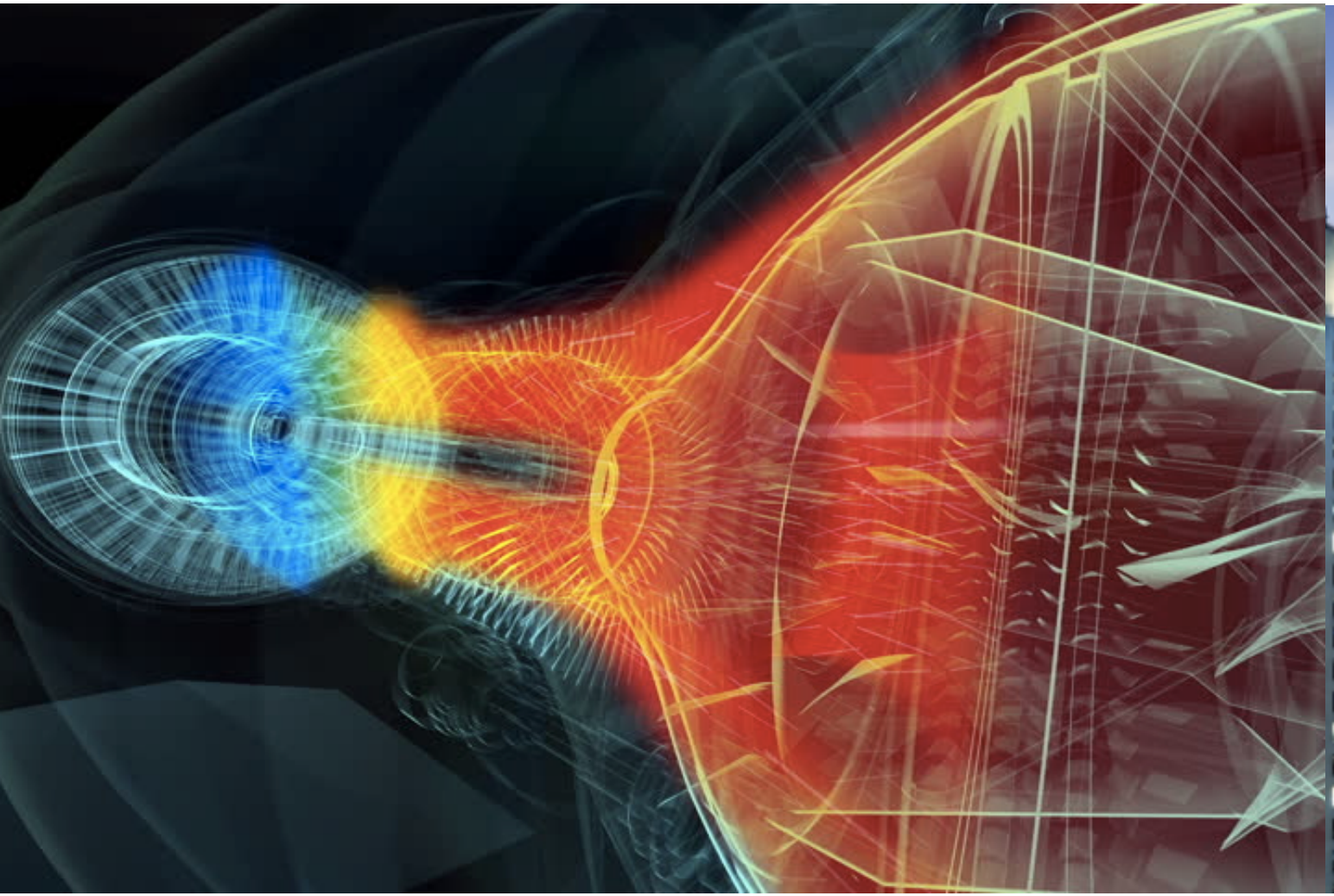
Scaling Data



Small Things, Very Big Data

Big Things, Very Small Data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Scaling Data
Environment of Small Things,
Very Big Data

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What's Lighting Got to Do with it?

What's Lighting got to do with it?

Symbiotic relationship between lighting and the sensory system

Lighting gives position and power

The sensory system gives every light intelligence

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What's Lighting got to do with it?

But it is **IoT** for commercial real estate **– not lights**

The data can be used for so many valuable applications

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What's Lighting got to do with it?

Lighting Controls:
Where are we today?

Where are we today?

Broken: Half of installed lighting controls don’t work or are disabled.

Where are we today?

Choice Paralysis:

Too Many New Products & Vendors Result in Delayed or No Purchase/Investment.

Where are we today?

Limits to Infrastructure Efficiencies and Energy Savings in Lighting

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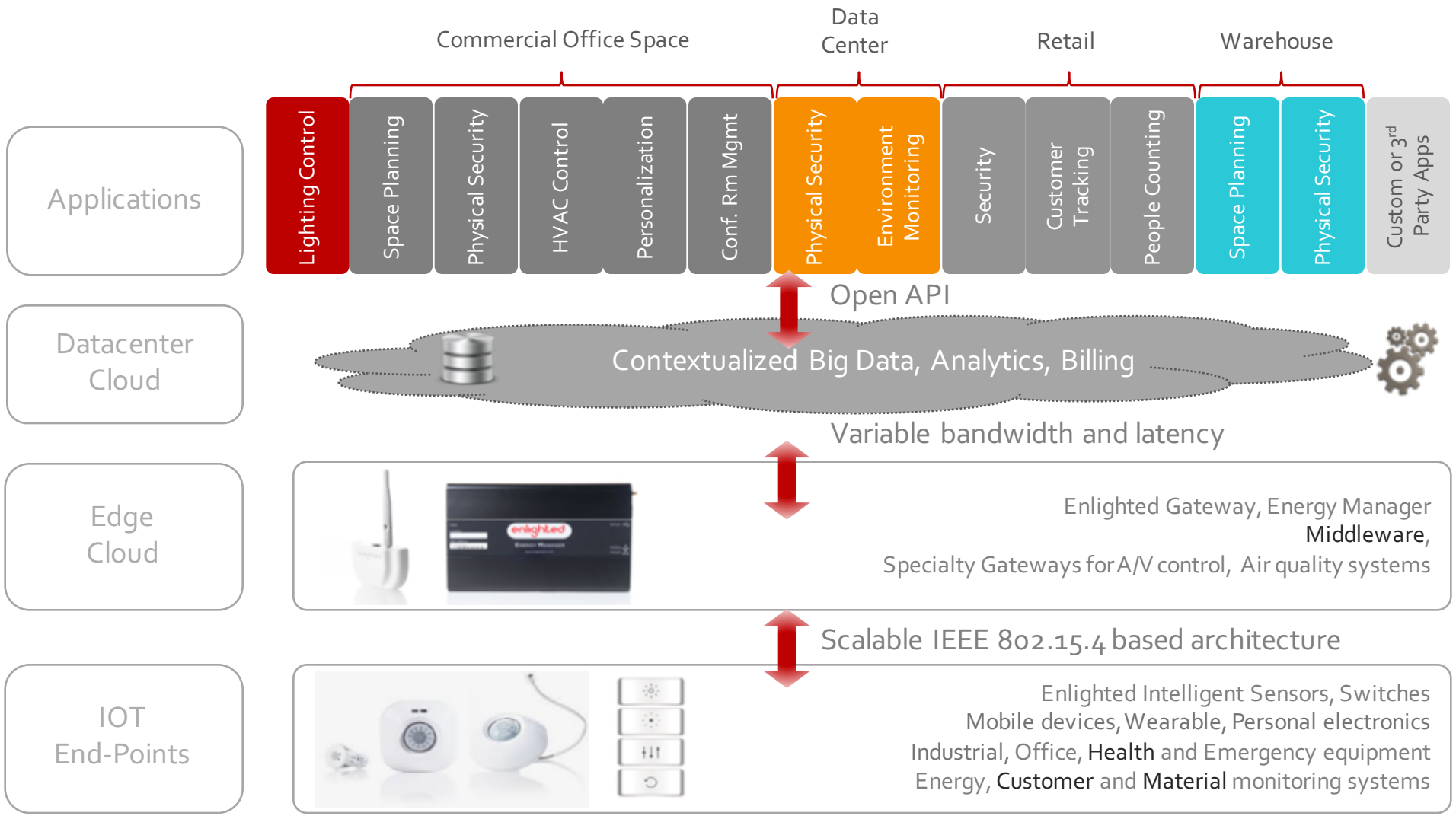
Where are we today?

The End of Lighting As We Know It?

Tech & Building Industries: Vastly Different Rates of Change
Where are we going?

Where are we going?

IoT Technology Stack



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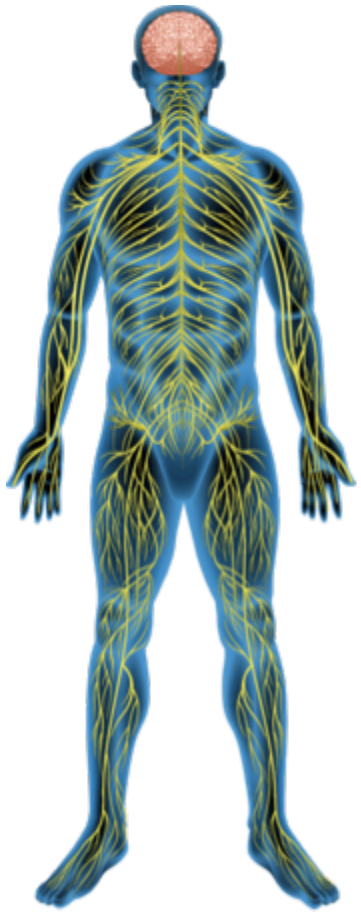
Where are we going?



Brain-
Central
Processing

Nervous System-
Transmission
Backbone

Hands-
Sensors,
Actuators

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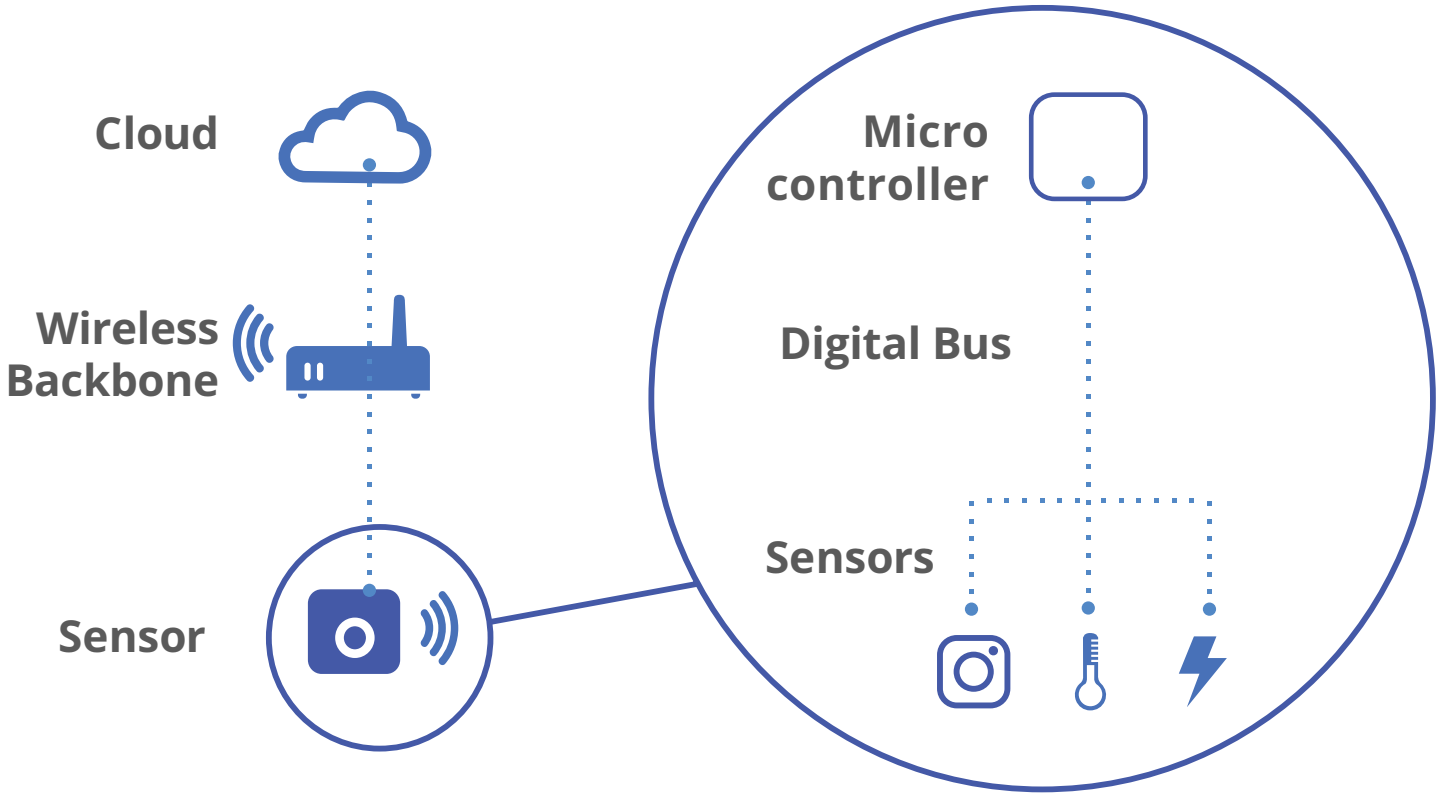
Where are we going?

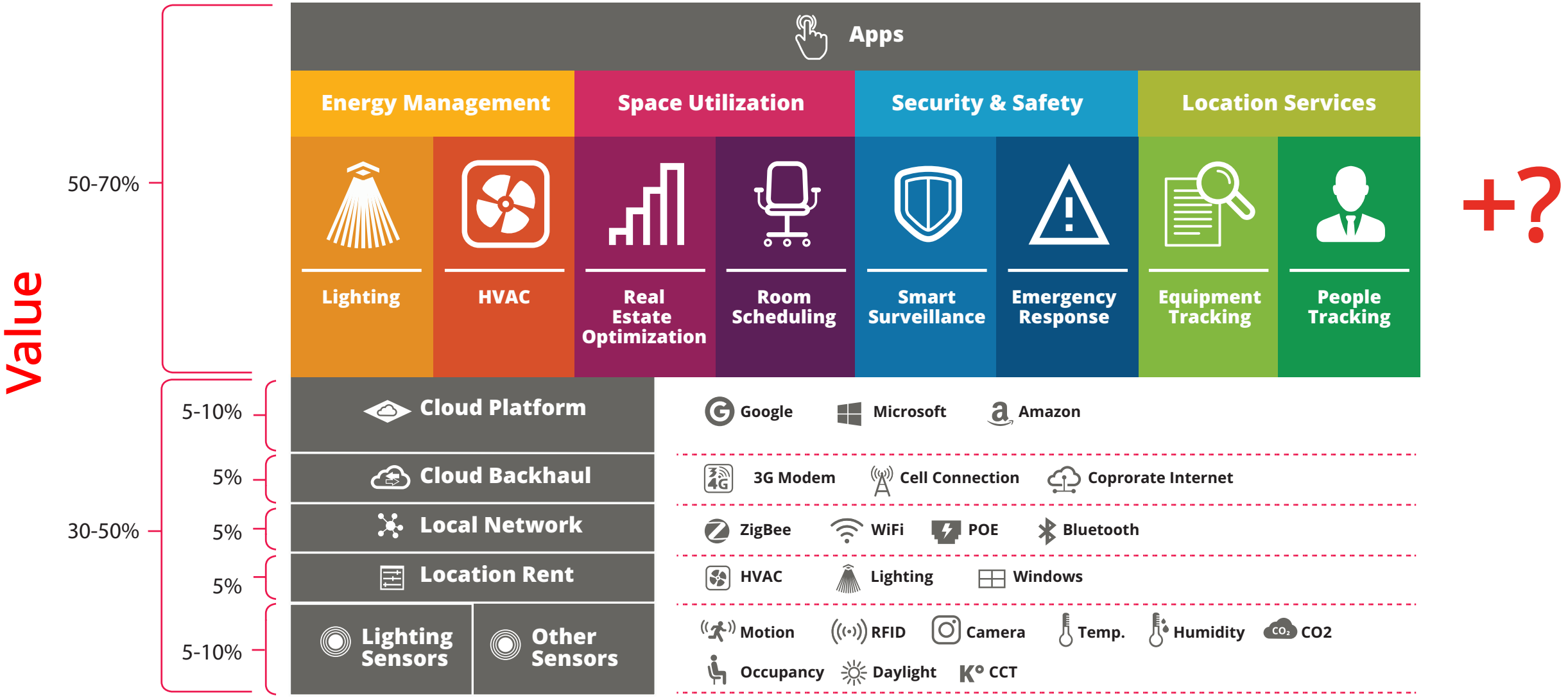
Recognizing Fractals



What for?


Energy Management
Space Utilization
Security & Safety
Location Services
Lighting
HVAC
Real Estate Optimization
Room Scheduling
Smart Surveillance
Emergency Response
Equipment Tracking
People Tracking

So, What's Important?



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So What should we Do?

What should we do?

Manufacturers- Build Products that are:

- Future-proof – a learning system at every level
- Secure
- Simple – Easy to use and high quality

Industry

- Bust Silos
- Promote Persistent Learning and Continuous Experimentation – Better Decisions

Future-proof

Product life cycles

- Tech Industry – change phones/laptops every 2 years
- Building Industry – Buildings designed to last 25 years
- Lighting Industry – 10+ year life

IOT for Buildings

- Sensor Software must be secure and fully upgradeable
- Sensor Hardware must have headroom
- The sensors should be digitally connected to the processor

Look for the most hardware headroom, sensor types and network bandwidth you can afford

Security

You are only as strong as your weakest link

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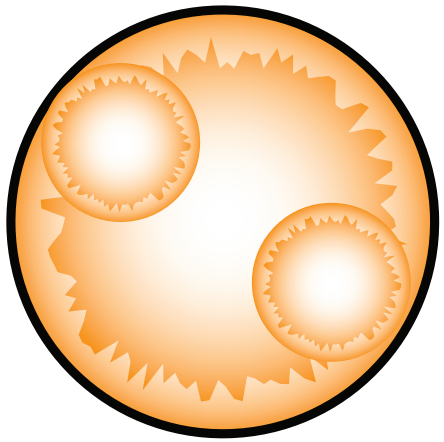
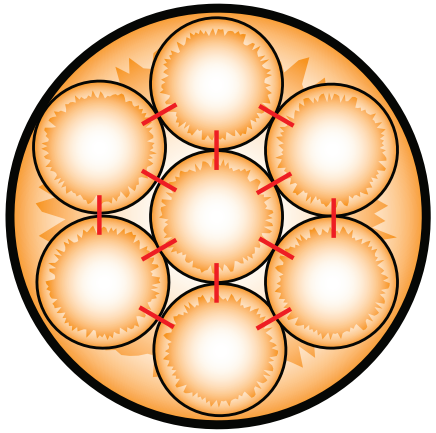
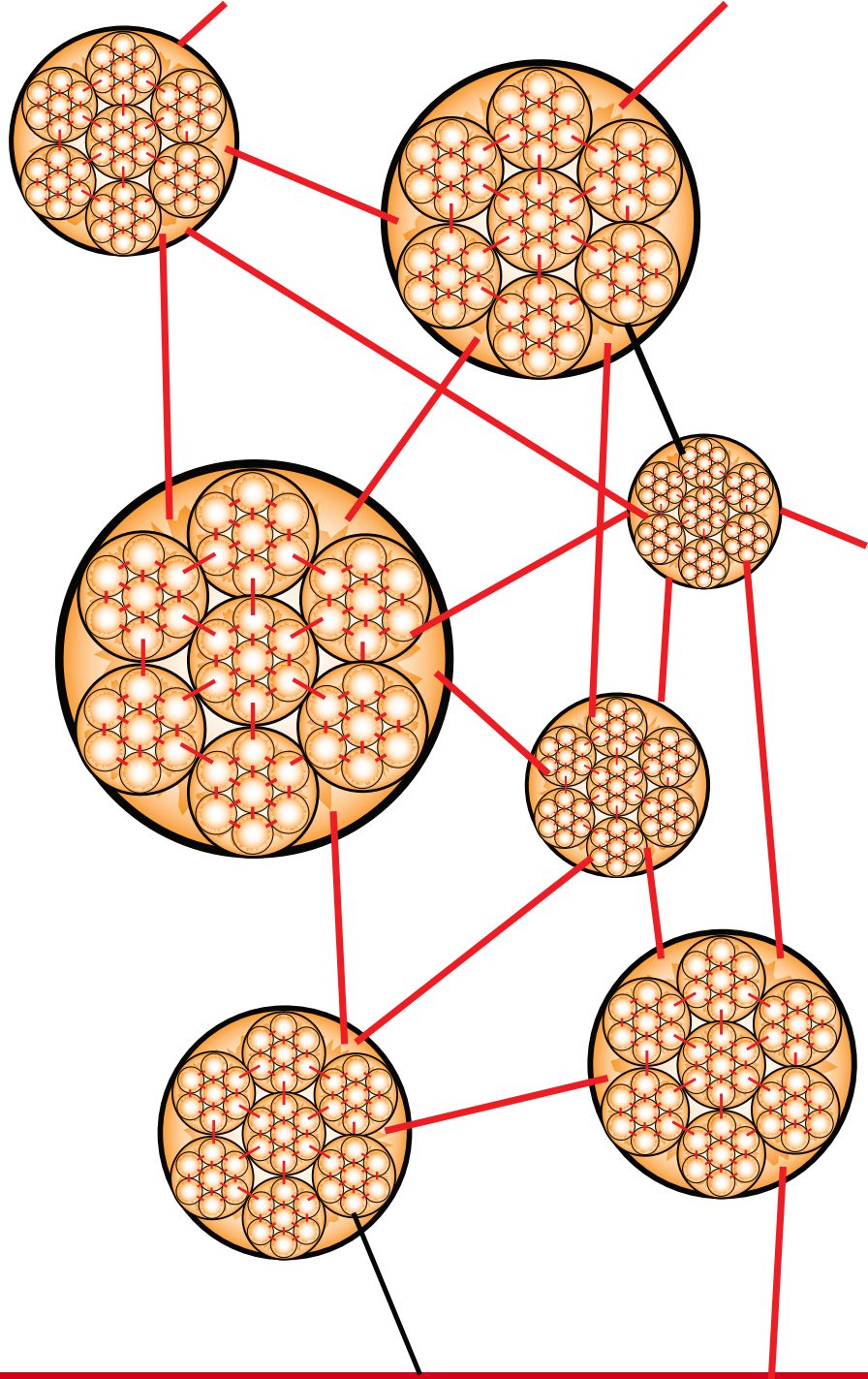


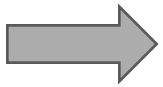




Security – Bolt On vs Built-in

Security – Sensor, Network, Cloud

- Protect the Devices (Sensors, Gateways, Severs)
  - Mutual Authentication (source of data is verified)
  - Software is signed and passwords/keys are encrypted
  - No back-doors! (no factory known passwords etc,)
  - Intrusion Detection and Prevention
- Protect the Communication Strong encryption
- Vulnerabilities will always exist – ensure upgradeability
- Understand your application and exposure



Balance Ease of Use with Security

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Adoption Depends on Quality & Simplicity

Silo Busting

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Do Persistent Research

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Thank You

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