# ASSOCIATED GENERAL CONTRACTORS | HOUSTON CHAPTER

# SOLUTIONS thru TECHNOLOGY CONFERENCE

11.28.2017

#### **SMART INTEGRATED BUILDINGS**

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## **Topics**

- > Part 1:
  - Market changes related to technology
  - Q&A
- > Part 2:
  - Benefits of integrated buildings for general contractors
  - Benefits of integrated buildings for owners and architects
  - Q&A
- > Part 3:
  - How integrated buildings can be specified
  - Q&A





Internet of Things (IoT)

## 50 Billion

devices expected by 2020



The rise of Cloud and Big Data

In	Ву
2012	2020
2.8EB of data	40EB of data
16% in the cloud	37% in the cloud



**Smart Buildings** 

Projected growth from

\$7.0bn to

\$17.4bn in

2019



79%

**S**martphone

owners Check

within 15 min of waking



## **Market Changes**

#### **Smart Building History**

- > Highly complex software deployments between disparate systems
- > Very expensive to develop and deploy
- > Typically bundled offerings of "shared tenant services" (circa 1980's)
- > Profibus, CABbus, Modbus RTU (circa 1980's)
- > BACnet & LONworks(circa 1990's)
- > Security industry API developments (circa 1990's)
- > TCP/IP (circa 2000's)
- > Plug & Play begins

**Systems Integration Skyrockets** 



## **Market Changes**

"Smart" Building and "Integrated" Buildings are broad terminologies:

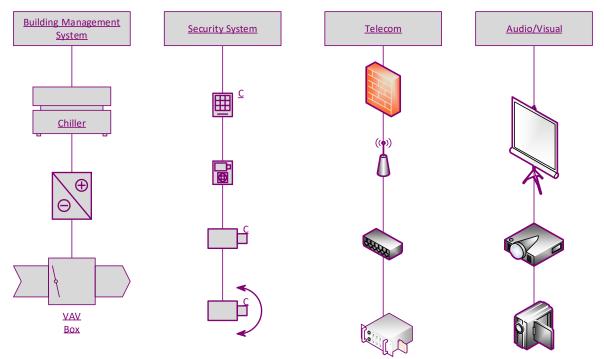
- > Special structured wiring?
- > Single platform for all buildings systems?
- > Structured cabling supporting BMCS, security, telecom, etc?
- > A BMCS interfacing to switchgear, speed drives, chillers, electrical meters?
- > Integrated building network





# **Market Changes**

## **Typical Building Systems**

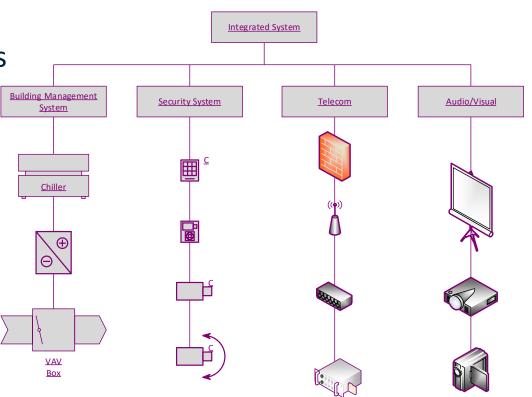




**Market Changes** 

**Integrated Building Systems** 

(integrated software & operations)

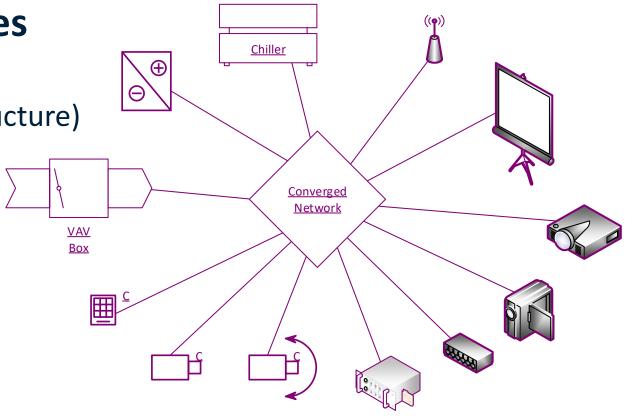




# **Market Changes**

**Converged Systems** 

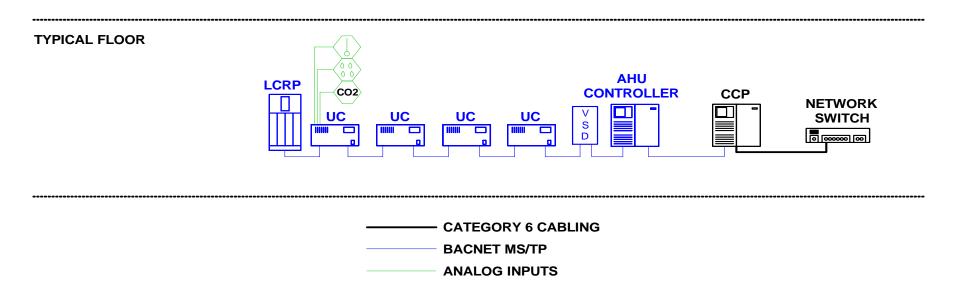
(integrated infrastructure)





## **Market Changes**

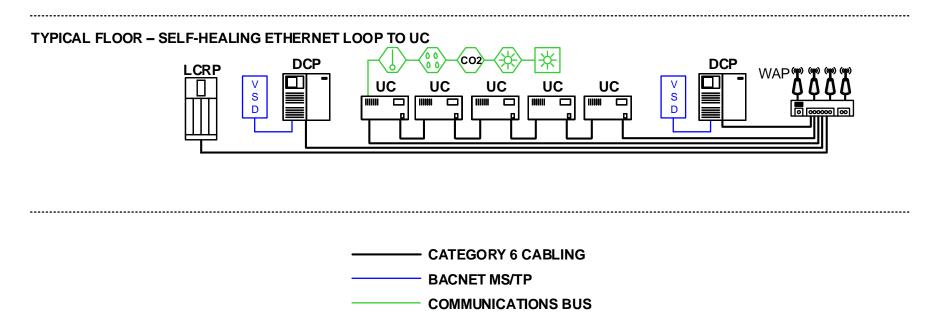
BMCS Floor Architecture – the past 15 years





## **Market Changes**

BMCS Floor Architecture – all IP





## **Market Changes**

#### HMA 5-Star Smart Building Rating System



Simple building controls with unitary or compartmental control



Direct digital control, central monitoring, local energy optimization



Comprehensive building management system with global energy optimization and integration to HVAC equipment, lighting control, power meters, etc.



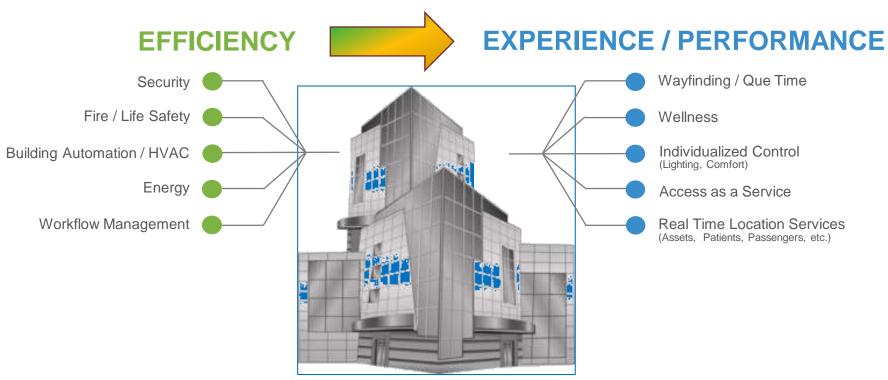
Above w/ integration to other building systems such as security, parking revenue, and/or parking guidance. May have structured cabling systems.



Above w/ advanced operational strategies deployed to enhance user experience and assist operations staff. Typically deployed via structured cabling systems.



## **Market Changes**





**Market Changes** 



Value created across all spend: 1% Energy, 9% Space, 90% People

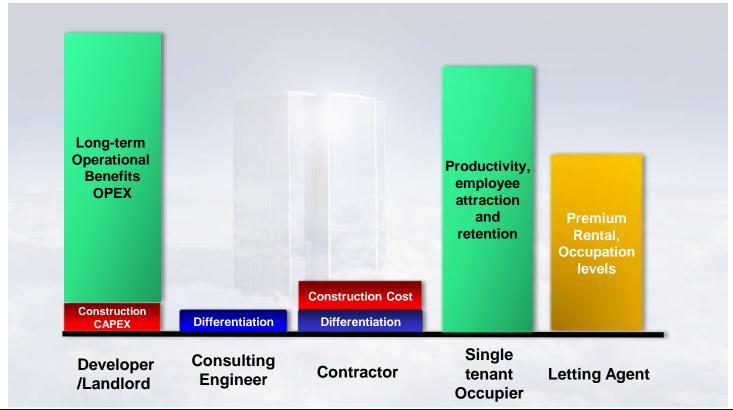


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# **Benefits of Integrating**





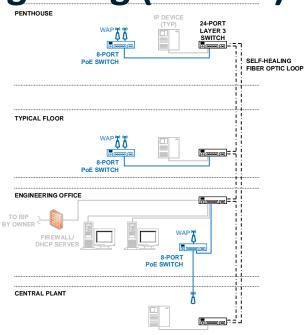
## Benefits of Integrating For General Contractors

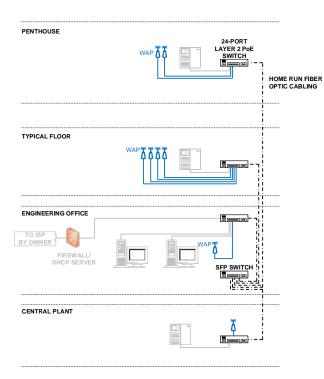
- > Less Onsite Coordination (Time =\$)
- > More Accurate Budgeting (No Scope Gaps)
- > Less estimating time/coordination (One vs Multiple Subcontractors)
- > Less Scope Creep (Reduce Change Orders and Time)
- > Easier and Faster Commissioning



**Benefits of Integrating (Owner)** 

Layer 2 vs Layer 3 (vertical infrastructure)





**BMCS ARCHITECTURE SCHEMATIC** 

LAYER 3

BMCS ARCHITECTURE SCHEMATIC

LAYER 2



#### **Benefits of Integrating – Infrastructure (Owner)**

#### IP Networks for BMCS need to more robust

- > IP Platform easily allows for other IP systems to reside for "free"
  - Security Access Control
  - Security Video Surveillance
  - Security Communication
  - A/V Communications
  - Elevator Communication
- > Easily accommodates dark fiber for:
  - Cellular DAS
  - First Responder DAS
  - Tenant infrastructure



## **Benefits of Integrating (Owner)**

#### **Additional Owner Solutions**

- > WIFI based engineering connectivity
- > Building work order smart phone apps



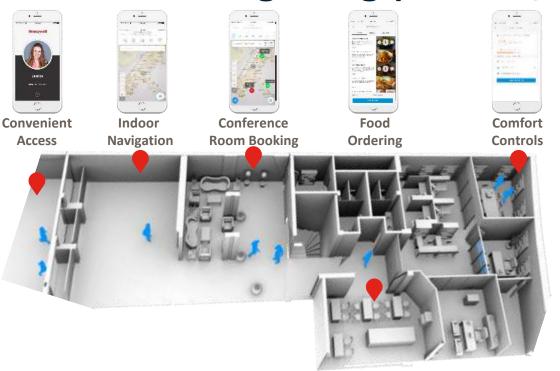
## **Benefits of Integrating (Owner / Architect)**

#### **Additional Tenant Solutions**

- > IP based wireless lighting control
- > Building informational kiosks
- > Building smart phone apps
- > Results
  - From reducing energy costs, to re-investing in the business
  - From securing the premises, to reducing risk
  - From reducing emissions, to improving health and productivity
  - From improving comfort, to improving test scores
  - From integrating systems, to driving greater revenue



**Benefits of Integrating (Owner / Architect)** 







**Driving Productivity and Enhanced Occupant Experience** 



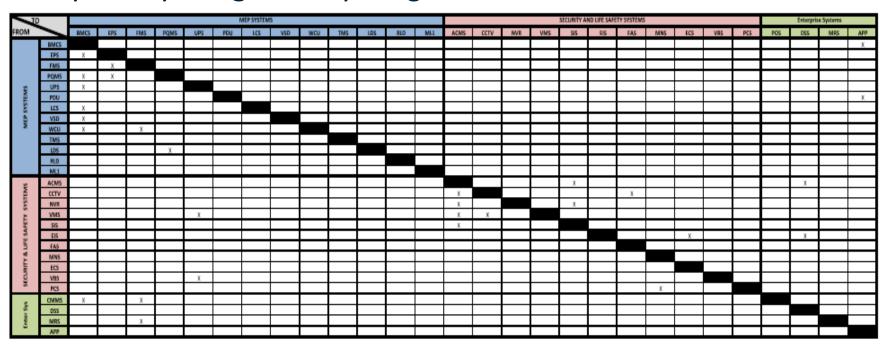
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## **Specifying Integrated Systems - Software**

Firstly – Why Integrate Anything? There Needs to be a Reason





## **Specifying Integrated Systems**

#### Specification Requirements – Fully Integrated

- > Fully "bundled" specification typically including:
  - Building Management
  - Security
  - Fire Alarm
  - Structured backbone
- > Defined software integration with other building systems:
  - Audio Visual
  - IT WIFI, Building Apps, DAS, etc.
  - Elevator



## **Specifying Integrated Systems**

Procurement Options – Fully Integrated

- > Full service low voltage subcontractor
- > Disparate subsystem providers with highly defined integration requirements



## **Project Example**

- Florida Advanced Manufacturing Research Center
  - Fire System
  - CCTV
  - Card Access
  - Toxic Gas Monitoring
  - Gate controls
  - Lobby Management For Visitor Staff
  - Building Automation
  - Energy Management
  - Intrusion Detection
  - Gate controls with two way communication





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