Micro Grids & Critical Infrastructure

Chicago Community Trust

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FIX CONSULTING

5/16/17

www.fixconsulting.com

totus
the totus group LLC
total facility optimization

FIX CONSULTING

abc

CBCS

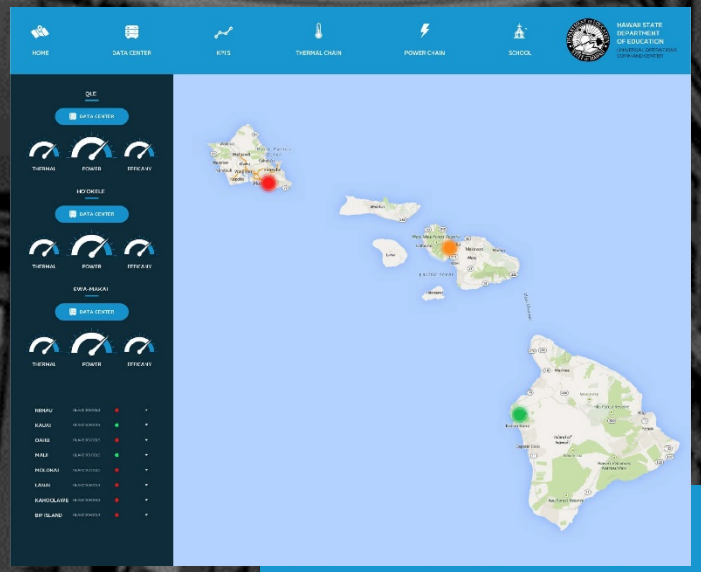
History: 1976 in Chicago, Independently owned & operated

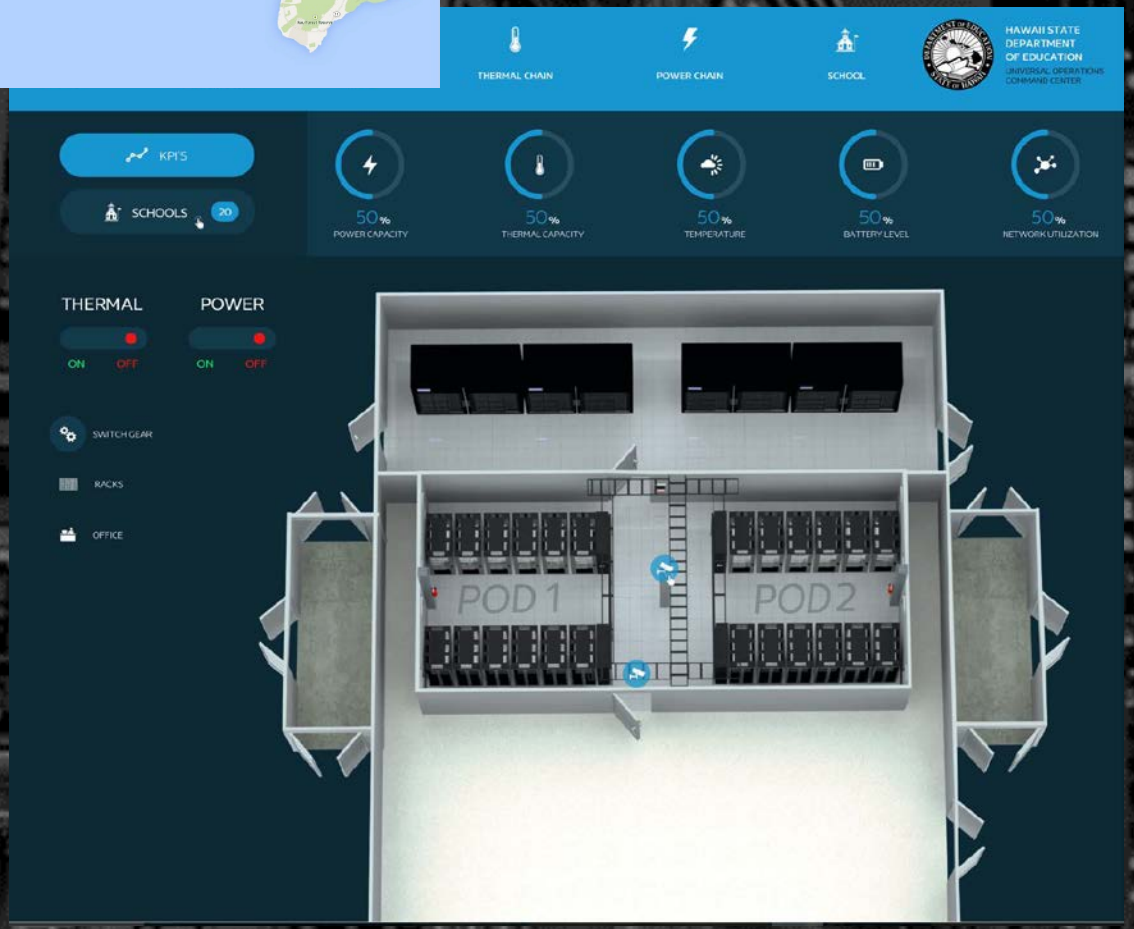
People: 75+ Engineers (Smart Building Software, Integrations, & Graphics)

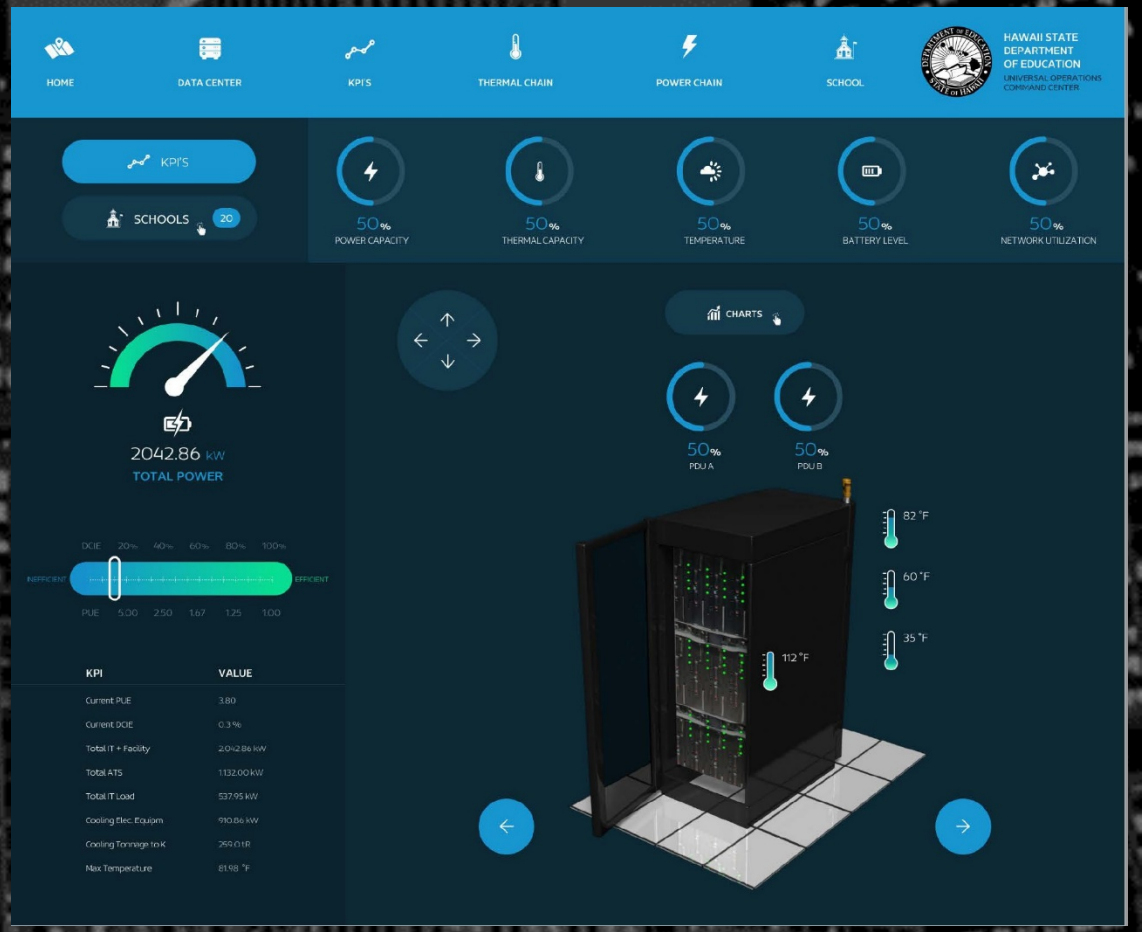
Our Work: Facility IoT (monitoring, controls, software, analytics, etc.)

Projects: Over 3000 installations (FAA, UIC, DOE, UAL, Microsoft, US Navy, …)

Sample – Recent Critical Facility Control/Monitoring Project (Hawaii DOE)







Key Talking Points – MicroGrid "Information/Data"

1. **Critical Infrastructure Support Buildings** – What is the role of the facility assets that support the grid (buildings for admin, data centers, maintenance, etc.)? How are they monitored, controlled, and protected (physically, cyber, environmental, etc.)?

2. **Critical Users** – How is "information" shared between the supply and load side? Are critical users able to communicate in real-time with the utility (power needs, load shedding, etc.)? Are there aspects that are "predicatable"? How do Smart Buildings/Cities impact MicroGrids?

Evolution of Facilities (Load-side) Technology

Irrigation

Meters

Security

Dry Wall

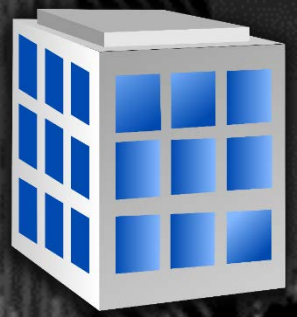
CMMS

HVAC

Lighting

AV/Data

Air Quality



Plumbing

Signage

Glass

Demand Response

Fire Alarm

Parking

Sensing, control & software is permeating every aspect of facilities

State-of-the-Art Facility Technology Developments

Design Technologies
(VR/AR, BIM/VDC)

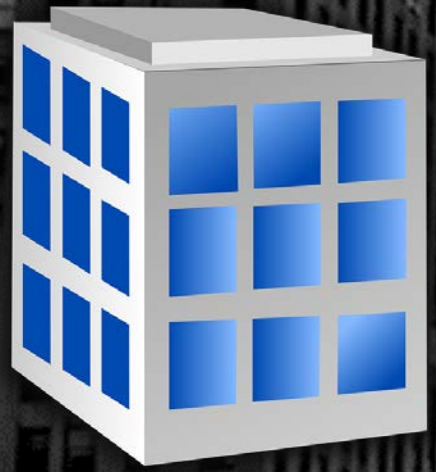
Construction Technologies
(3D Printing, IP-based "brains")

Maintenance Technologies
(Virtual Operators with AI)

Artificial Intelligence (AI) Operations

Proprietary Facility Systems PREVENT Smart Cities/Buildings

Proprietary Silo Systems



Fire

Lighting

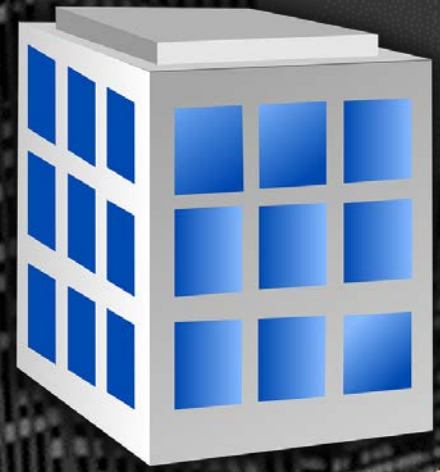
HVAC

Security

Smart Buildings in Smart Cities

Building Occupant Apps

Cloud Computing



Smart Cities

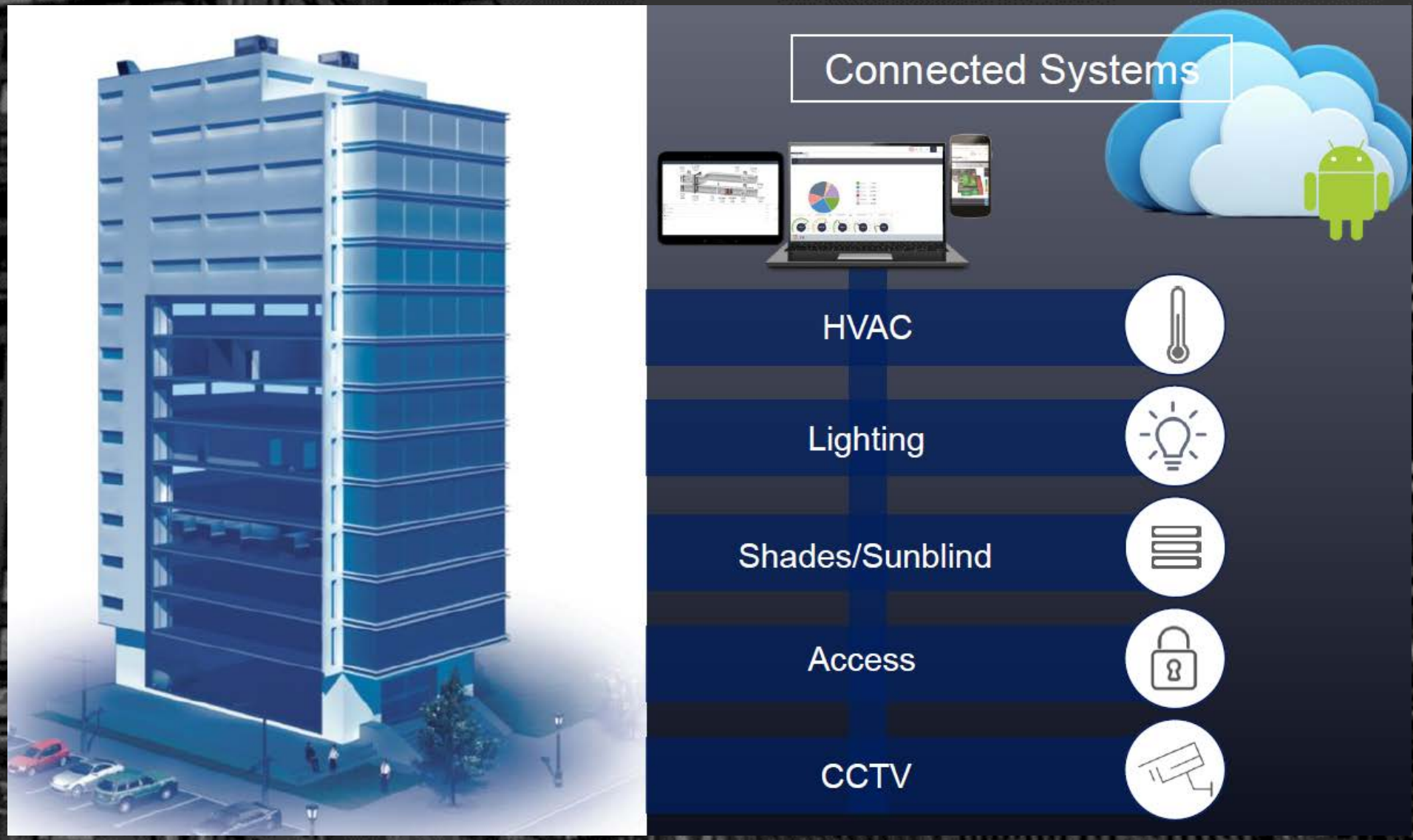
Smart Grid

SINGLE PLATFORM, ANY DEVICE

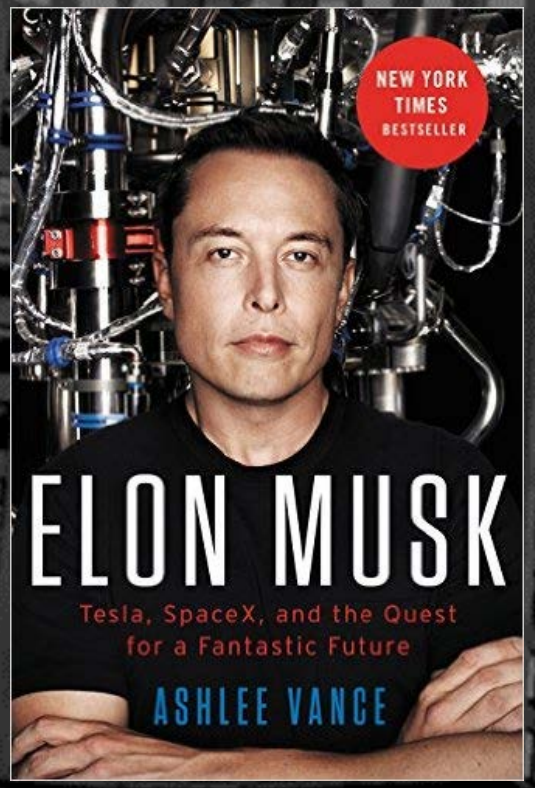
Facilities (load side) have “Operating Systems” for data systems

	OS	Hardware Choices	Authorized Providers	3rd Party Software	
Laptops	Windows 10	Dell, HP, Toshiba, Acer, Lenovo, ASUS, MSI	Limitless	AutoCAD, Adobe, Office, Dropbox, Evernote, Facebook etc., etc.	OPEN
	OS X El Capitan	Apple MAC	Limitless		OPEN
Cell Phones	ANDROID	Samsung, Motorola, LG, ASUS, Sony, ZTE, Google, Kyocera	Limitless	Uber, Pandora, Adobe, Office, Dropbox, Evernote, Twitter, etc., etc.	OPEN
	iOS	Apple iPhone	Limitless		OPEN
Buildings	METASYS Johnson Controls	JCI	JCI	Utility management, metering, dashboards, plant optimization, demand response, room control phone apps, etc., etc.	CLOSED
	APOGEE SIEMENS	Siemens	Siemens		CLOSED
	niagara AX TRIDIUM	JCI, Siemens, Honeywell, United Technologies, Acuity, Schneider-Electric	JCI, Siemens, Honeywell, United Technologies, Acuity, Schneider-Electric, and more…		OPEN

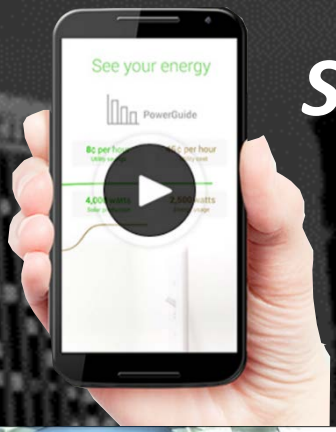
MicroGrid Reliability will depend on Smart Buildings & Cities (Loads)



The Solar MicroGrid Leader: *"We always design a very sophisticated computer first, before the product."*



Tesla



Solar City

SpaceEx