



# Information Technology in Facilities Management

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## What would you do?



lan @12sh0tsDeep · 3h  
[redacted] #SOS please it's so hot in [redacted] (has been for a while) and the professor can't figure out how to turn it down. #Please



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Timothy D Sands @VTSanman  
@12sh0tsDeep I understand that today is the big day when @VTFacilities flips the campus switch from heating to cooling.

lan @12sh0tsDeep @VTFacilities God bless for all of you thank!

VTFacilities @VTFacilities We have a snow in clouds to look into Pamplin 30, but we are flipping the switch on the appropriate campus buildings.

lan @12sh0tsDeep @VTFacilities thank you guys so much, y'all rock!



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## Administrivia

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Credit(s) earned on completion of this course will be reported to American Institute of Architects (AIA) Continuing Education Session (CES) for AIA members.

Certificates of Completion for both AIA members and non-AIA members are available upon request.

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



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## Course Description

### 530 - Information Technology in FM

Information technology plays a critical role in the day-to-day operation of a Facilities Management organization. This course will provide a discussion of how FM organizations can leverage information technology to improve the effectiveness and efficiency of their organizations. Topics discussed include work management systems, analytics and reporting, and mobile technology.

*Faculty Member: Chris Smeds*



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## Learning Objectives

1. Learn how information technology plays a critical role in day-to-day operations
2. Discuss how FM organizations can leverage information technology to improve their organization
3. Discuss work management systems
4. Learn how analytics, reporting, and mobile technology will increase productivity.

AIA  
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## 4 Questions

What is one tool that would make your job better/easier/quicker.

What is one thing that if you KNEW it, it would make your job easier/better/quicker?

What is one thing (process) your organization does well?

What is one thing (process) your organization doesn't do well?

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## Demystifying technology

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“Today’s cutting edge technology is tomorrow’s broken legacy system.”

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Middle Ages Tech Support

<http://www.youtube.com/watch?v=pQHx-SjgQvQ>

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Kids of Today vs 1980’s Technology

<http://www.youtube.com/watch?v=7v75QpvlSUs>

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## What is technology?

- The application of scientific knowledge for practical purposes
- Nicholas Carr suggests 4 categories of technology:
  - 1) those that extend our physical strength – the plow, hammer, fighter jet
  - 2) those that extend the sensitivity of our senses – the microscope, Geiger counter, smoke alarm
  - 3) those that reshape nature to better serve our needs – reservoirs, plumbing, genetically modified corn
  - 4) those that extend or support our mental powers – calculator, the book, the computer, the Internet

13

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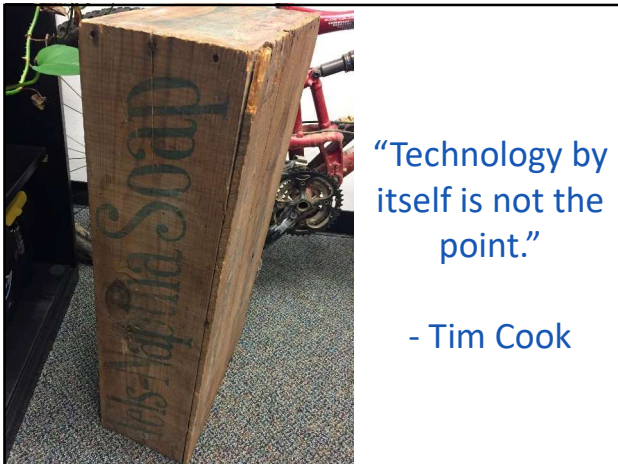
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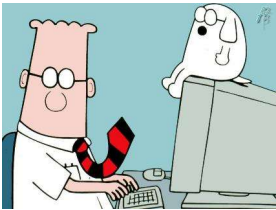
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## Information Technology

It's not just for nerds...



- Tools
- Information
- Process
- and...
- People

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## Tools

If all you have is a hammer, everything looks like a nail.

- Things that help us do our job or get things done
  - Email, word processor, spreadsheet, cell phone, GPS
- Easy to see why we use them:
  - They make us more effective
  - Save time & money
  - Allow us to do things we otherwise couldn't do
- But, there are challenges:
  - We have to make them easy to use
  - Making sure you have the right tool for the job | which is faster: pencil or iPad?
  - Cost vs. benefit – how do you measure?
  - "Access to technology" issue
    - How do you get tech to people (or vice versa)?
    - Lost productivity – is he a plumber or a data entry clerk?

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## Information

Just the facts, ma'am

- Data! Facts! Knowledge!
- Why collect information?
  - Sometimes, you just have to
  - Measure success
  - Helps you improve process...
  - Helps you tell your story
- Different information matters to different people
  - What information does a mechanic need?
  - What information does a frontline supervisor need?
  - What information does a superintendent need?
  - What information does an executive need?
  - What information does a customer need?
- Reporting vs. Analytics vs. Business Intelligence (BI)

17

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## Process

That's how we roll

- Simply defined: the way we do things
  - Some are good ... some are, well, bad!
- Why is process important?
  - We want to do the right things the right way
  - Because we don't want to do bad things more effectively!!!

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**People**  
Mother knows best

- People love change... or do they?
  - Do people really resist change?
- Change management & unintended consequences
- User experience (UX)
  - Ease of use
  - Efficiency
  - Aesthetic
- **TRAINING!!!**

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**Putting it all together...**

The ideal IT solution: bake **information** (collection) into your **process** – use technology (**tools**) as needed and **REMEMBER** the **PEOPLE!**

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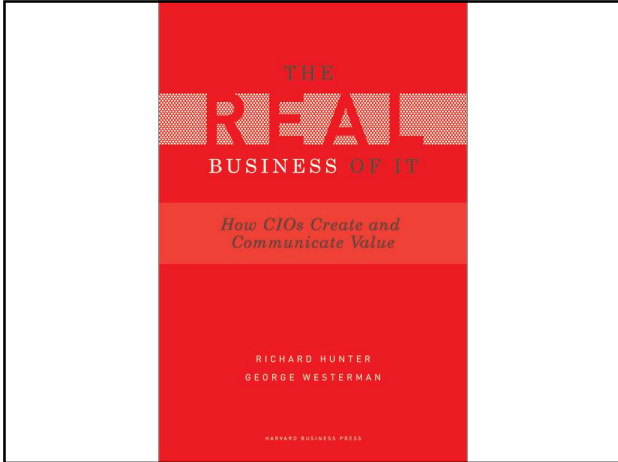
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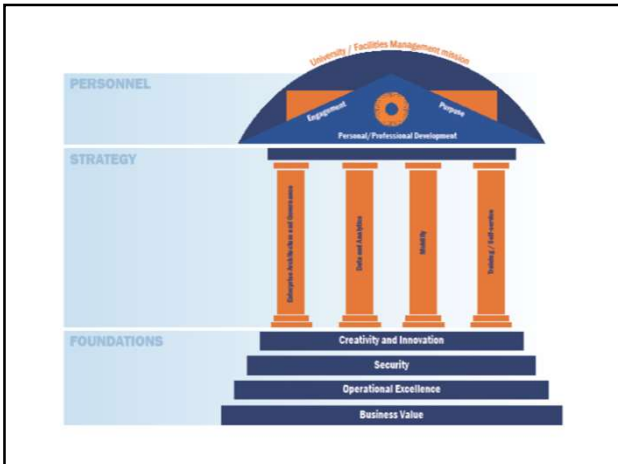
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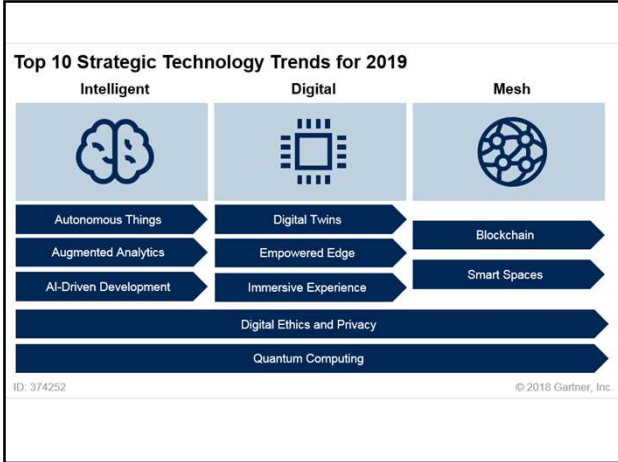
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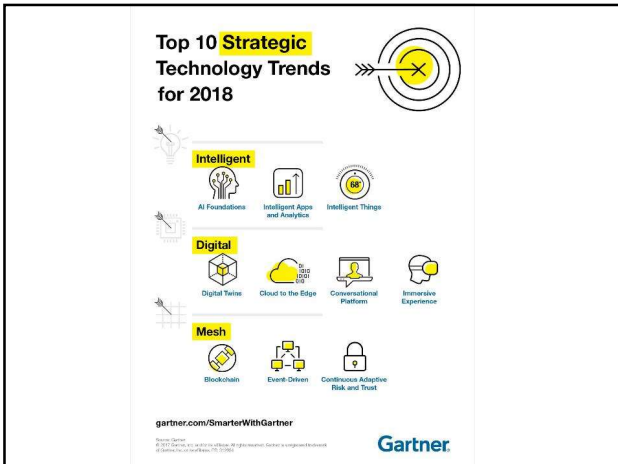
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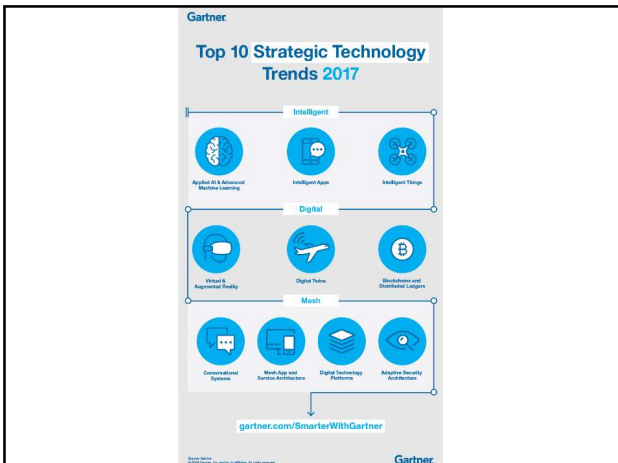
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Gartner's Top 10 Strategic Technology Trends for 2016

1. The Device Mesh
2. Ambient User Experience
3. 3D-Printing Materials
4. Information of Everything
5. Advanced Machine Learning
6. Autonomous Agents and Things
7. Adaptive Security Architecture
8. Advanced System Architecture
9. Mesh App and Service Architecture
10. Internet of Things Architecture and Platforms

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**Top 10 Strategic Technology Trends for 2015**

<b>Merging the Real World and the Virtual World</b>	1	Computing Everywhere
	2	The Internet of Things
	3	3D Printing
<b>Intelligence Everywhere</b>	4	Advanced, Pervasive and Invisible Analytics
	5	Context-Rich Systems
	6	Smart Machines
<b>The New IT Reality Emerges</b>	7	Cloud/Client Computing
	8	Software-Defined Applications and Infrastructure
	9	Web-Scale IT
	10	Risk-Based Security and Self-protection

29

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The image shows the book cover for 'Rise of the Robots: Technology and the Threat of a Jobless Future' by Martin Ford. The cover features a stylized robot figure. To the right of the book cover is a photograph of a Starbucks coffee machine dispensing coffee into a cup.

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## Innovation

### Innovation Days

100:10:2

#### ARKit demo:

<https://www.youtube.com/watch?v=vKnGTOQQM-I>

#### BIM demo:

[http://www.youtube.com/watch?v=nHGhH9g4\\_gg](http://www.youtube.com/watch?v=nHGhH9g4_gg)

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## Computing everywhere




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## Wearable tech – too far?



**FitBark**

<https://www.fitbark.com/>

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### CapturX Smart Pen

Division of Public Works  
122 Riverside Street  
City, State 55555


capturx

Date	12-19-21	Time	10:12	Culvert Number	
Location	Cloudy	Weather	Clear, Cloudy	Material	None, Light, Medium, Heavy
Collected By	Andrew Szwedka	Waterbody	None	Site Map / Sketch	
Location Note	On Main Road				
Date Commented	02-03-22				

2. Public Works Follow-up  
Check all that apply:  
 Photograph was taken at this site  
 Work order needs to be sent to other departments  
 Site Needs to be repaired  
 Physical Observations:  
a. Culvert Type  Pipe  Box  Concrete  White PVC  Green PVC  Corrug. Metal  
b. Culvert Material  Dry  Low Flow  Moderate  Heavy  
c. Flow Amount  None  Minimal  Moderate  Severe  
d. Erosion  None  Metal  Wooded  Damaged  
e. Guardrail  None  Metal  Wooden  Damaged

3. Work Orders Needed:  
 Sewerwater  
 Parks  
 Streets

4. Additional Comments:  
Concrete casing is cracked and needs replacing



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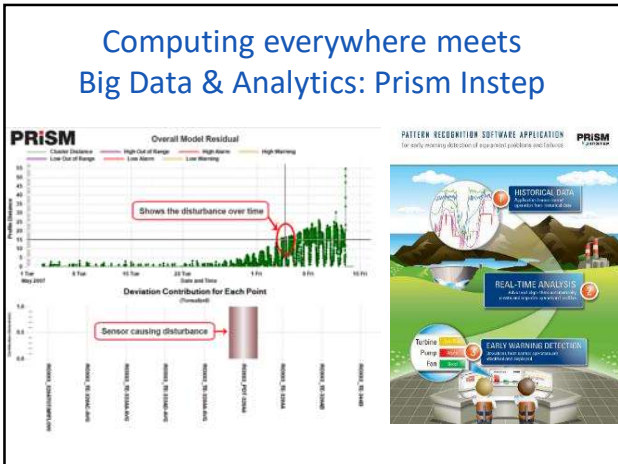
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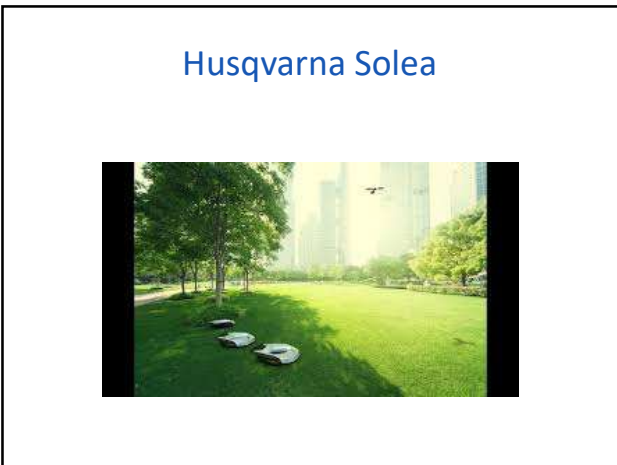
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**What does innovation really mean to you and me?**

- **Yesterday:**
  - Reporting
  - Client-server
  - Cloud/SAAS/hosted solutions (really about sourcing)
  - Social
- **Today:**
  - Mobility
  - Location awareness
  - Business Intelligence | Analytics | Big Data | Modeling
- **Tomorrow:**
  - Wearable tech
  - Augmented reality
  - Internet of devices
  - 3-D printing
  - Facilities Informatics
  - Autonomous things (where you might not even expect them!)
  - Digital twins

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## Perils of IT

- Technology for technology's sake a.k.a. "Shiny Object Syndrome"
- Cost vs. Benefit
- Security
- Privacy
- Policy
  - Privacy
  - Data management
  - Data Protection
  - Freedom of Information Act (FOIA) / eDiscovery
  - Bring Your Own Device (BYOD)
- Unintended consequences
- Risks of reliance on technology

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## Sourcing IT

- Where do you get IT Services?
- Commercial Off the Shelf (COTS) Packages vs. In-house development
- Hosting vs. on premise systems
- Contracting vs. in-house development
- Enterprise Resource Planning (ERP) System vs. Best-of-Breed
- System Integration

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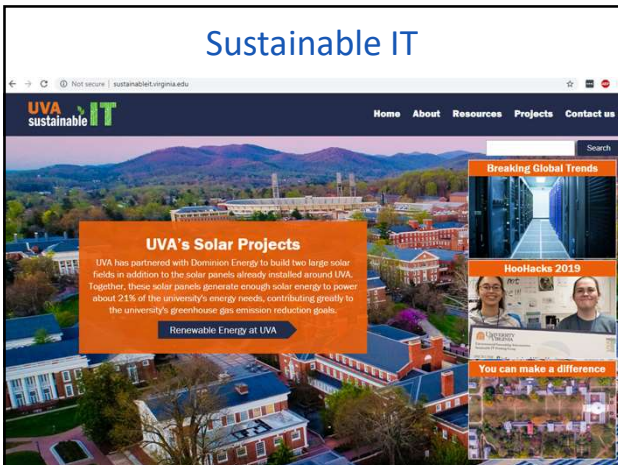
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## Sustainable IT



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### Brainstorm! How would you use...

- Maintenance
  - Custodial
  - Landscape
  - Project Management
  - Energy & Utilities
  - Finance
  - HR
  - ...
- iPad (tablet)
  - iPhone (smartphone)
  - Google Glass
  - Augmented Reality
  - Business Intelligence/Analytics
  - A drone
  - ...

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### An Interlude

(a Public Service Announcement)

- Safe computing
- What is the #1 way attackers compromise systems?
  - Us!!!
  - Social Engineering
- Protect your passwords
- Antivirus isn't enough!
- Malware
- Phishing
- YOU have to be aware ... and suspicious!
- A note on copyright

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### What systems are used in Facilities Management?

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Evolution of Maintenance Management Systems

- Computerized Maintenance Management System (CMMS)
  - Maintenance management
- Enterprise Asset Management System (EAM)
  - Asset management

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Evolution of Maintenance Management Systems

- Computer-Aided Facility Management System (CAFM) aka Facility Management System (FMS)
  - Space management, alphanumerical and graphical
  - Facility management
  - Reactive Maintenance management
- Integrated Workplace Management System (IWMS)
  - Real Estate and Lease management
  - Facilities and Space management
  - Maintenance management
  - Project management
  - Environmental sustainability

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Maintenance Management Systems

- AiM
- Maximo
- TMA
- School Dude
- Discussion:
  - What are you using?
  - What do you like?
  - What don't you like?
  - What does it do well? What is it missing?
  - How are you using it?

51

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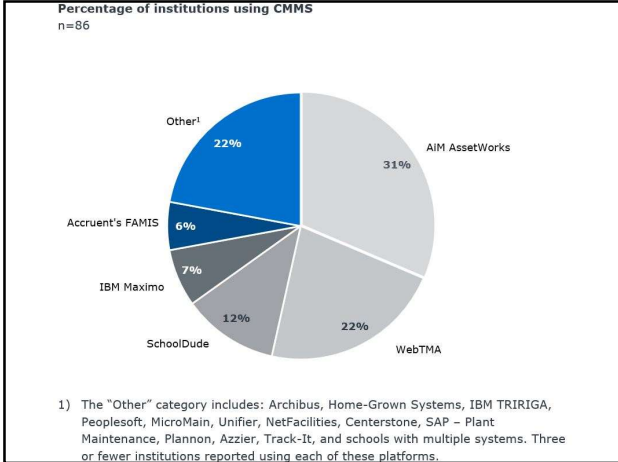
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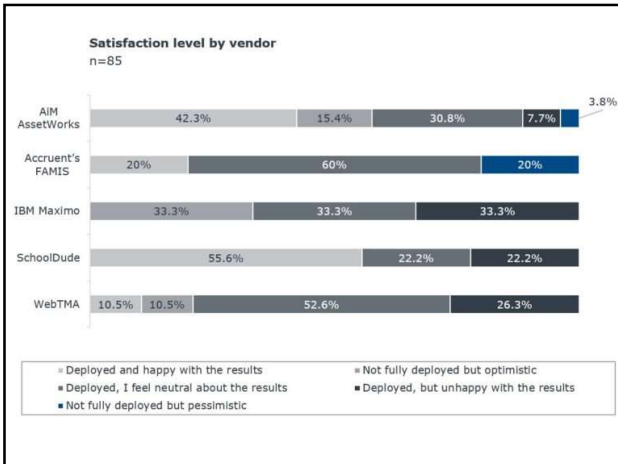
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## Capital Project Management Systems

- Schedule
- Financials
  - Budget
  - Expenses
  - Forecasting
- Resource Allocation
- Project & Portfolio Management
  
- Discussion:
  - What are you using?
  - What do you like?
  - What don't you like?
  - What does it do well? What is it missing?
  - How are you using it?

54

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## Space Management Systems

- Computer-Aided Design (CAD)
- Geographic Information Systems (GIS)
- Space Management Systems
- Building Information Modeling (BIM)
- Construction Operations Building Information Exchange (COBie)
- Discussion:
  - What are you using?
  - What do you like?
  - What don't you like?
  - What does it do well? What is it missing?
  - How are you using it?

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## Energy & Utilities Systems

- Building Automation Systems (BAS) & Supervisory Control and Data Acquisition (SCADA)
- Metering
- Monitoring
- Modeling
- Smart buildings
- Dashboards
- Discussion:
  - What are you using?
  - What do you like?
  - What don't you like?
  - What does it do well? What is it missing?
  - How are you using it?

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## Other Systems

- Finance
- Human Resources
- Procurement
- Inventory
- Document Management
- Collaboration (e.g. SharePoint)
- Web sites
- Discussion:
  - What are you using?
  - What do you like?
  - What don't you like?
  - What does it do well? What is it missing?
  - How are you using it?

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How else are smart organizations (you) using IT?

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Imagine...

- What are we going to be using in 2033 (ten years)?
- Think back to your answers to the four questions...
  - Can you imagine a tool?
  - What information will you be utilizing?
  - How will they change your processes?

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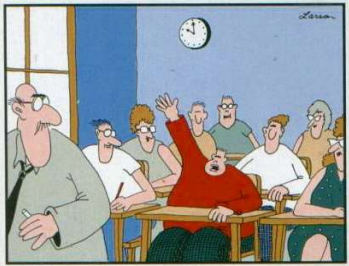
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Q & A – or other topics



"Mr. Osborne, may I be excused?  
My brain is full."

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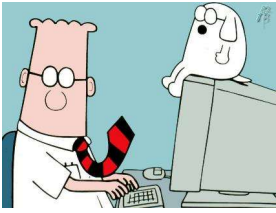
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You can be a nerd, too!



- Tools
- Information
- Process

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THIS CONCLUDES THE AMERICAN  
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