



Fort Worth, TX | January 2019

# Technologies and Strategies to Achieve Facility Information Management (FIM) Excellence

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**P R E S I D E N T**

Since 2015

# Course Goal

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*Note: instructional graphics and system screenshots shown in slide deck were created by the University of Kentucky unless otherwise noted*

- Discuss FM technology advancements for effectively managing facilities information
- Focus on important components and success pathways of each
- Evaluate organizational management strategies to support successful implementation



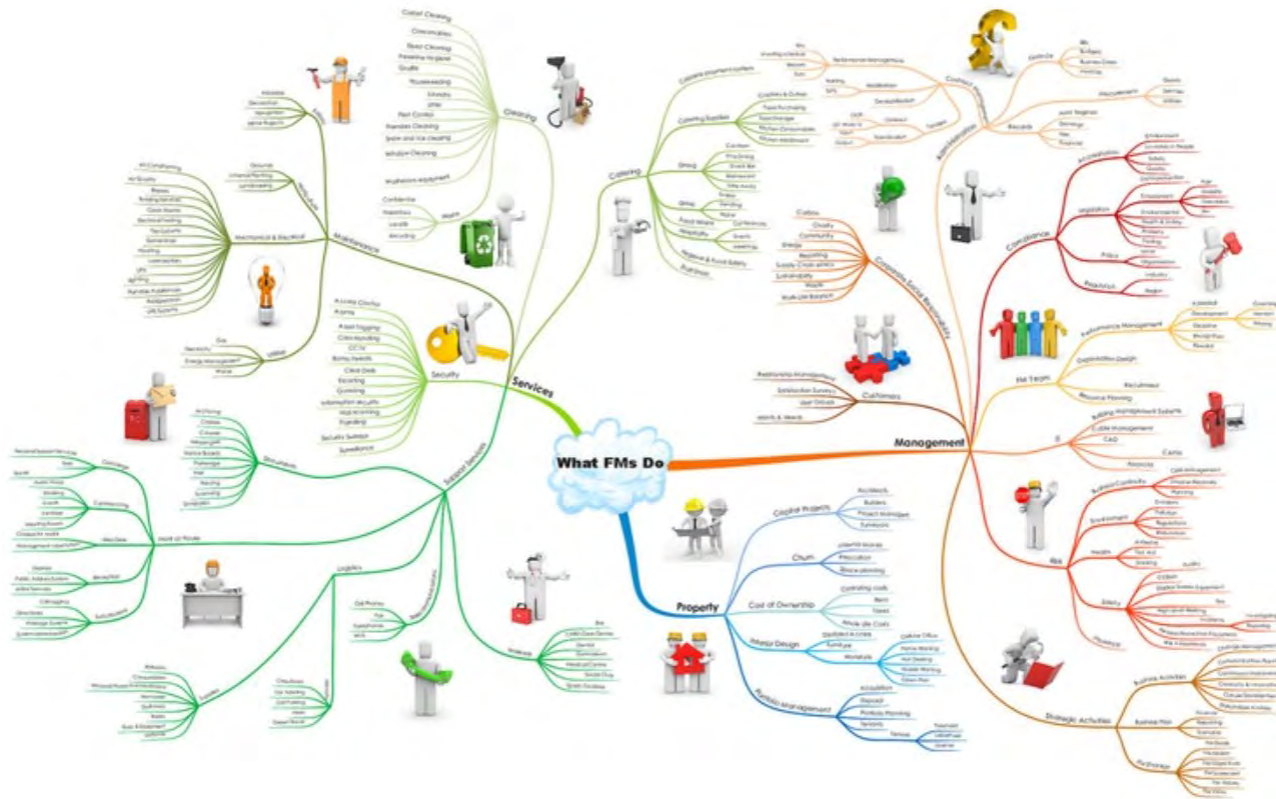
Big Gorilla Business

**Timely** access to **current** information, **when** you want, **how** you want it.





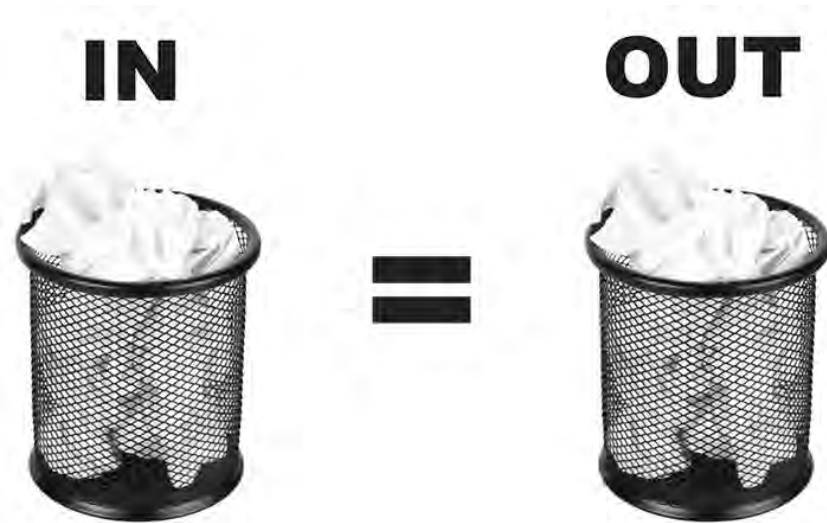
# Goal: System Utopia



# Challenge

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The quality of the input determines the quality of the output. In other words, in a processing system, the data's quality coming out cannot be better than what went in.



**Garbage In Garbage Out**

# Key Elements of FIM Excellence

People | Processes | Technology

# FIM Excellence – Seamless Flow of Facility Information

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- **Processes** that support system development
  - **People** dedicated to *continuously* improving systems and data
  - **Technologies** that support your people, processes, and information needs
- 

Managing Change --- Smart Campus Design --- Standardization --- System Integration --- System & Data Governance

--- Employee Empowerment --- Thinking ahead to find ways to use technology to best manage facility information

# Key FIM Elements

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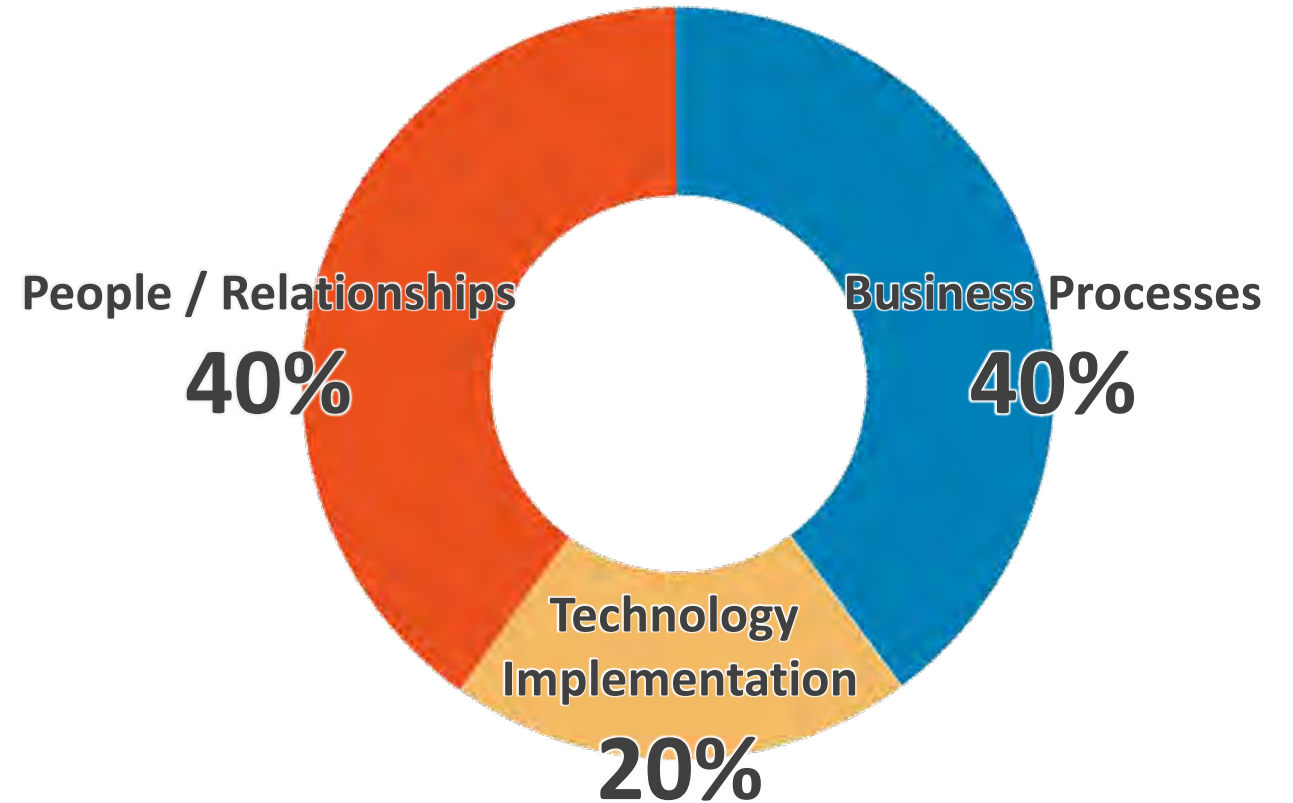


Percentage  
breakdown of  
each?



# Key FIM Elements

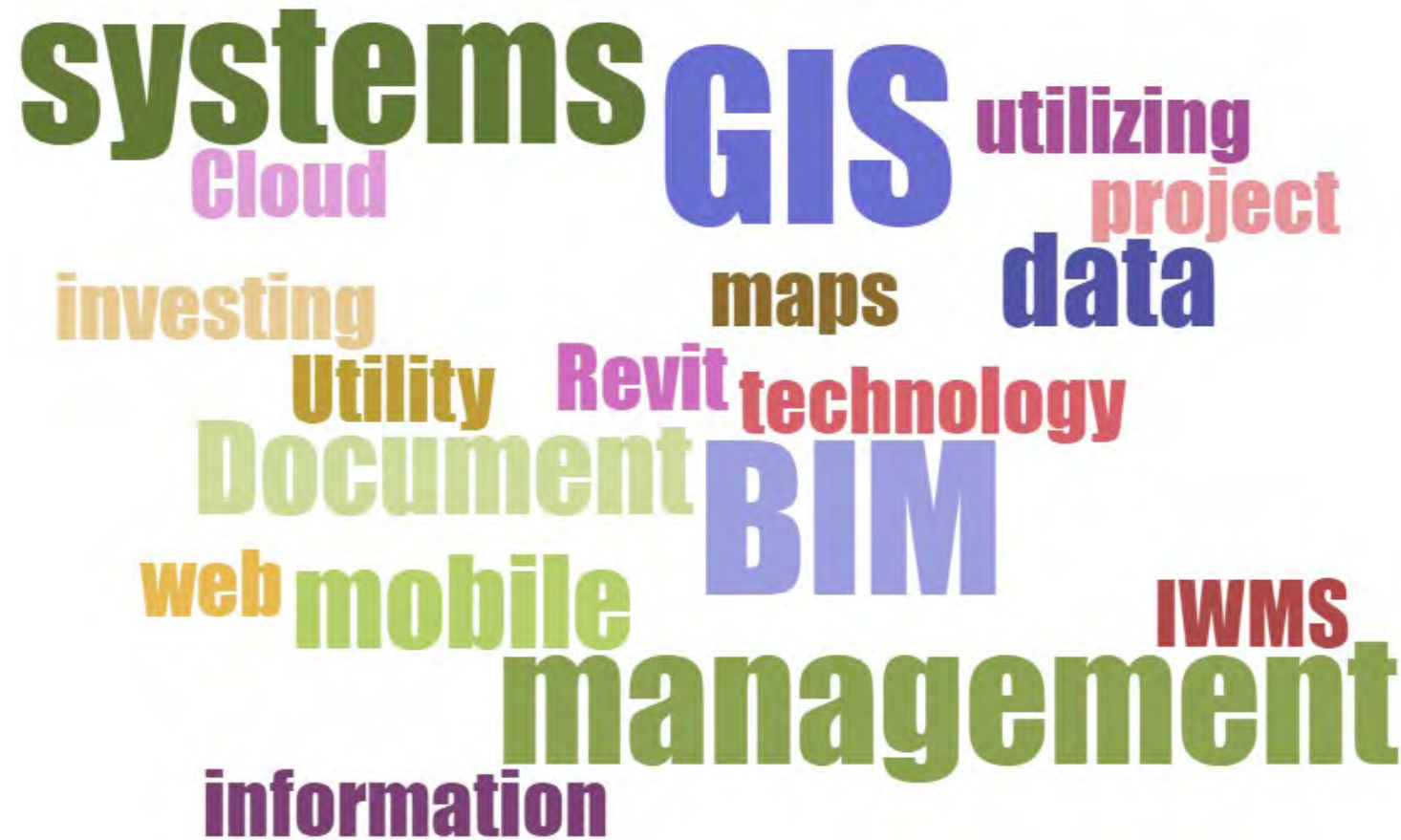
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Technology has transformed the way  
higher-ed institutions operate

# What FM technology advancements are you re-defining internal strategies for?

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# FIM is Technology Agnostic

*Note: Solutions shown represent a subset of available solutions and are listed for discussion purposes only.*

## Smartphone



## BIM

GRAPHISOFT  
ARCHICAD

AUTODESK®  
REVIT®



## GIS



## ERP



## Database



## BMS, CAFM, CMMS, IWMS...



## Base Your Decision On:

- What information is most important to my institution?
- What enterprise systems does my institution currently use?
- How much can I afford?
- Will the system I want integrate with our existing critical systems?
- What is required to maintain the system information and infrastructure?
- Do I have the right people to manage the system?
- What is our long term plan and will this technology enable our success?

# FIM Technology Advancements

Geographic Information System (GIS)

Building Information Modeling (BIM)

Integrated Workplaces Management System (IWMS)





# GIS – Geographic Information System

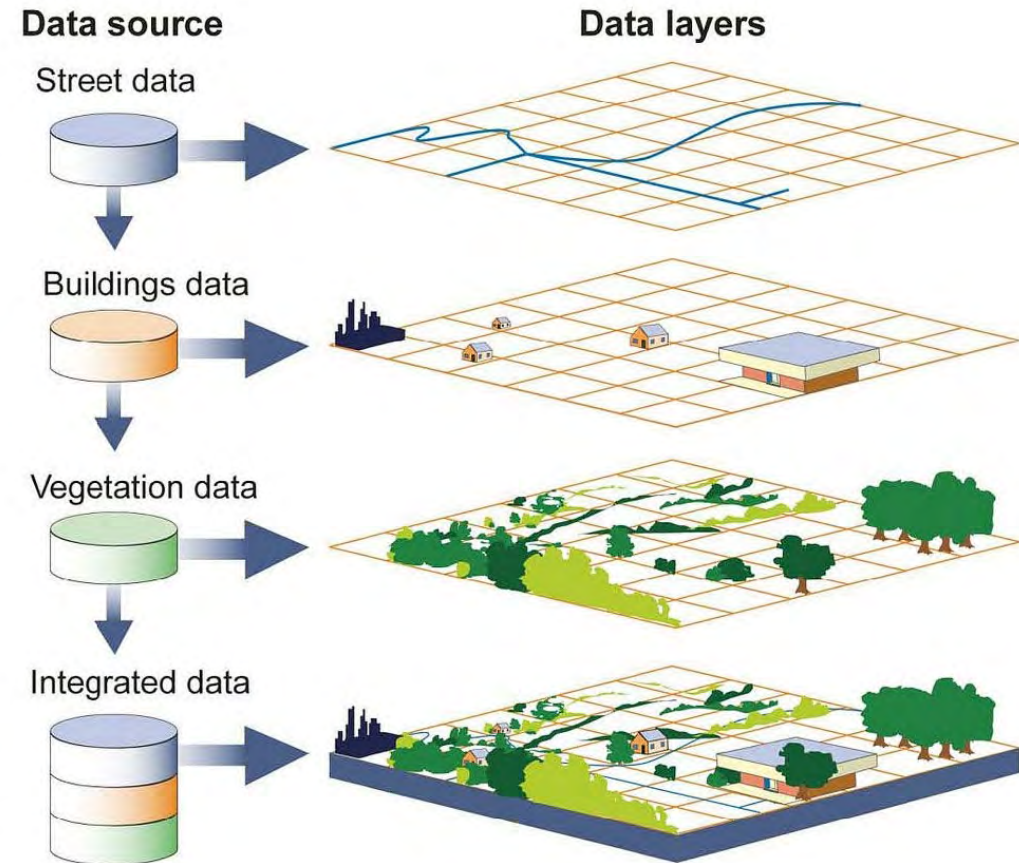
\ˈjē-, ˈī-, ˈes \

## GIS is....

- A system to capture, store, manipulate, analyze, manage, and present all types of geographic data
- Requires processing methods
- The standard for enterprise mapping and web map publishing

## GIS is NOT...

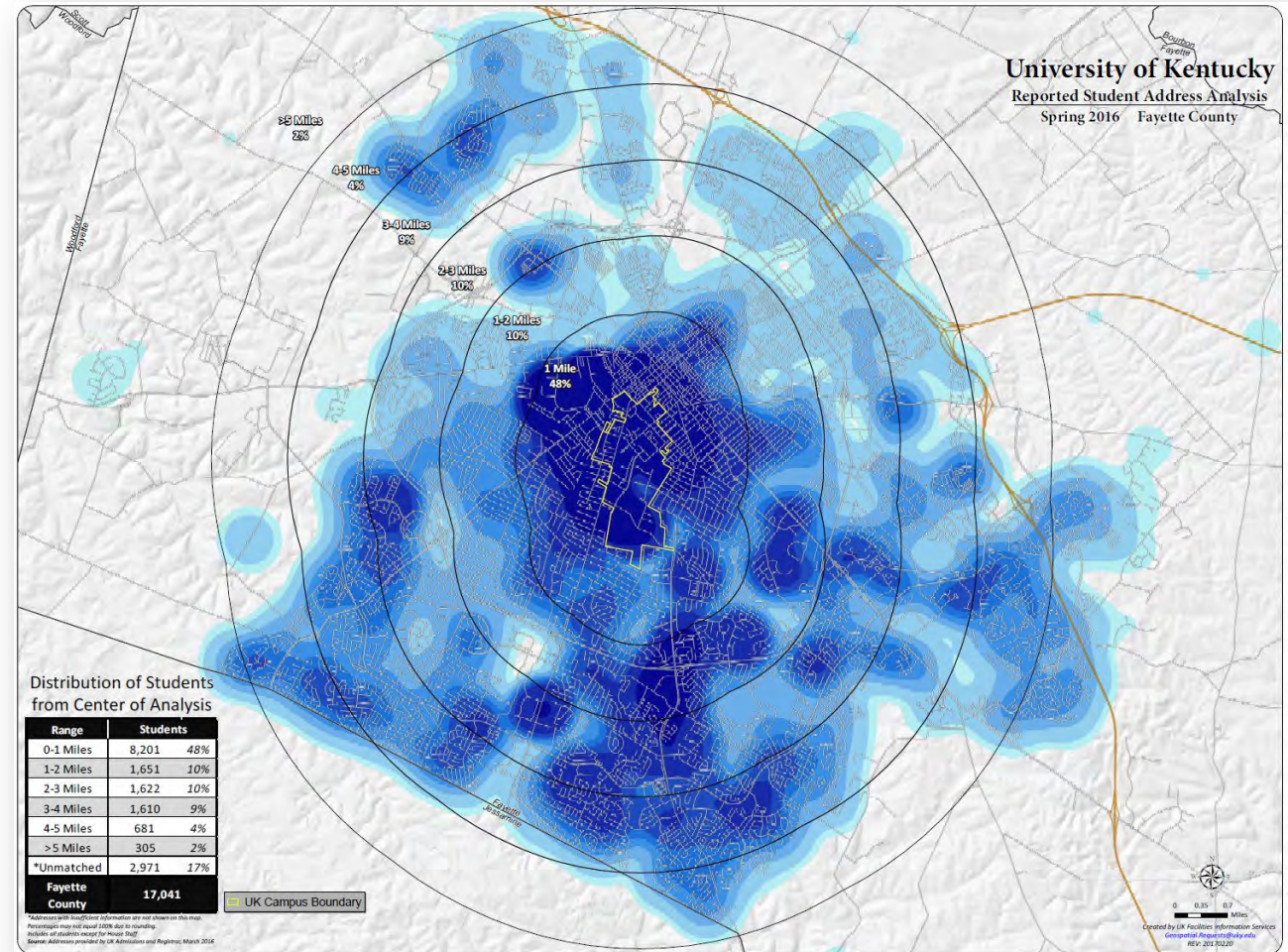
- Just a map or pictures
- A file format (it's managed as a database)
- Software





# Why GIS?

- A living graphical representation of your physical assets for wayfinding and analysis
- Computable Geometry (“geoprocessing”)
- A database that can easily integrate with other databases
- Easily deployed to web and mobile
- Customizable
- Scalable

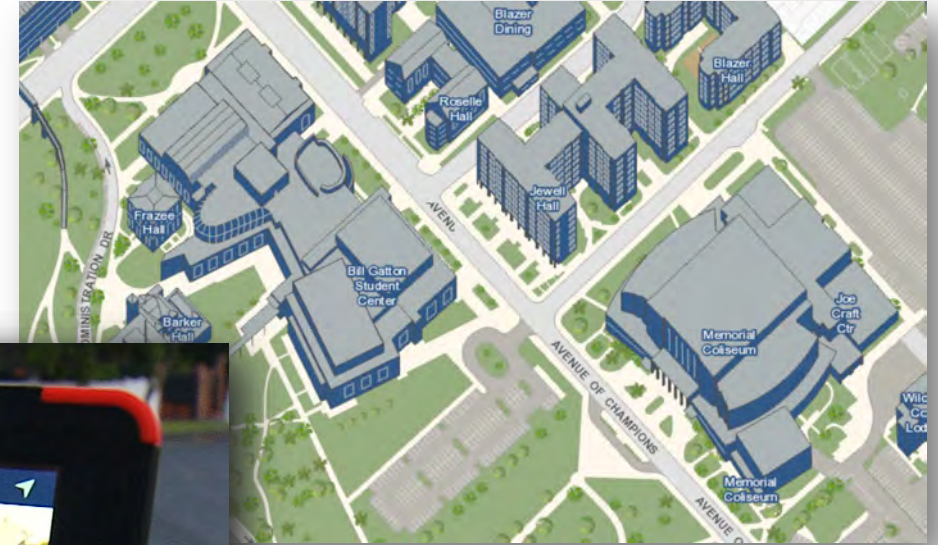




# GIS – Critical Datasets

- Basemap
- Floorplans
- Utilities

...also imagery





# Use Case: GIS

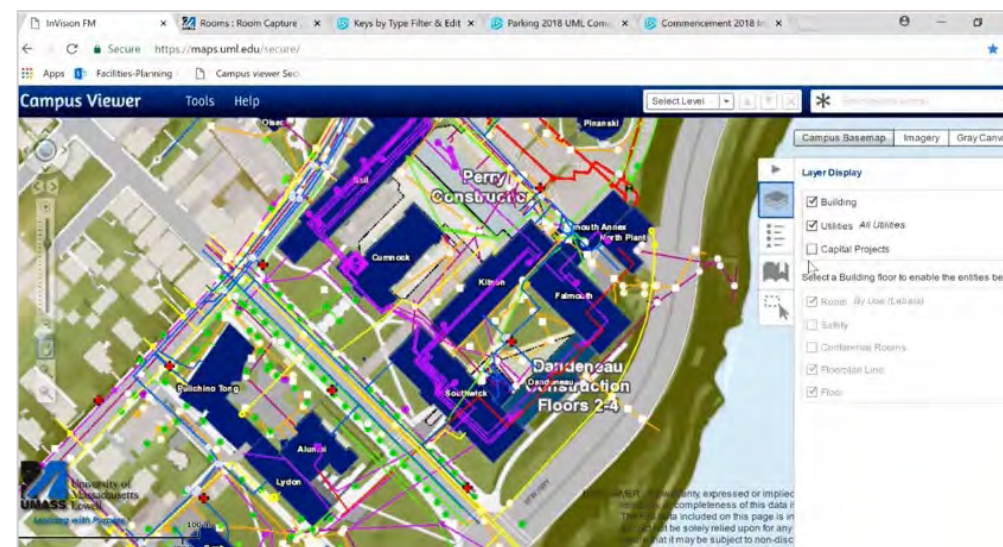
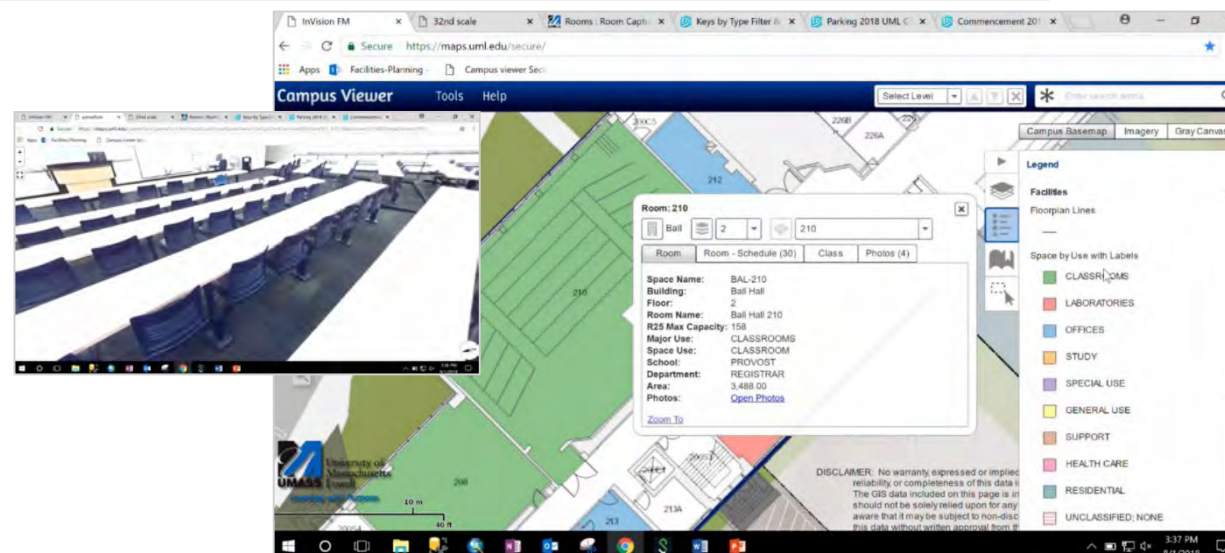
## Situation

Wanted to: view *campus level* information including basemap, utilities, and large capital projects. | view *building level* information including occupants, active AEP\* projects, floor plan docs, building archives. | view *room level* information including usage, ownership, room schedules, utilization studies, classroom capacities, seating types, photos.

## Result

Created Campus Viewer web application to pull all information together. System integrated with existing floor plan and building archived documents. Used 360 camera to capture room photos.

\*Accelerated Energy Program







# Use Case: GIS



University of Colorado  
Boulder

## Situation

Wanted to create a tree inventory system to track ownership, maintenance, tree zone, storm damage (moderate-severe), trees with memorial/donation plaque. Planned for digital transfer from paper archives, managing treatment of infestations, measuring canopy coverage for the Tree Campus USA certification.

## Result

Tree inventory effort launched in Spring of 2012. Was complete in time to be proactive with responding to the Emerald Ash Borer (EAB) infestation alert in September 2012. GIS enabled Grounds to be proactive with treatment and efficiently plan, budget, strategize, and deploy treatment effort.







# GIS – Key Strategies

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- Identify Internal Champion
- Create “One Map” [\[Audit\]](#)
- Main Campus Website Integration
- Partner with IT
- Implement Processes and Procedure [\[Process\]](#)
- Standardize [\[Standardize\]](#)
- Deploy Enterprise Solutions [\[Automate\]](#)
- Collaborate & Integrate
- Outreach and Education



Beware of systems that look like GIS but aren't



# BIM – Building Information Modeling

\ˈbim\

## BIM is....

- A business model defined by processes and workflows
- The standard for building design, construction, and operation
- Integrated geometry & facility information
- Mandated in many countries\*

## BIM is NOT...

- Just 3D modeling
- A file format
- Software



*\*Global BIM Standards: Is Your Country Next*

<https://constructible.trimble.com/construction-industry/global-bim-standards-is-your-country-next>

Tennessee State Government

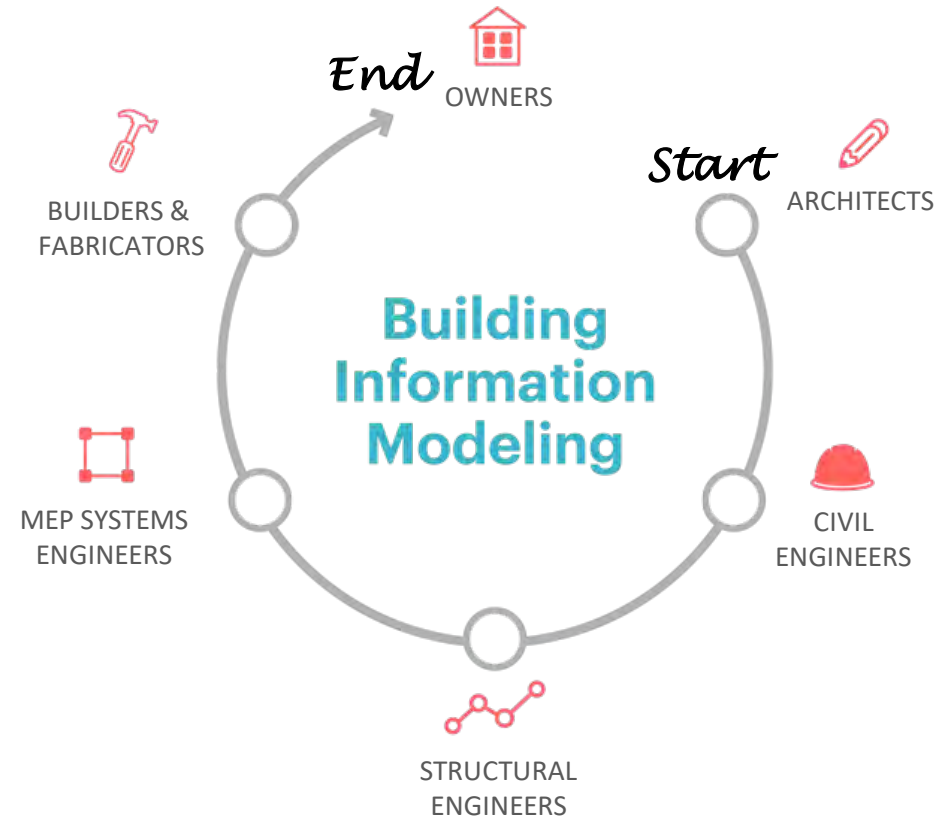
<https://www.tn.gov/osa/capital---real-estate/capital-projects/bim-standards.html>

Image Credit: Google Images

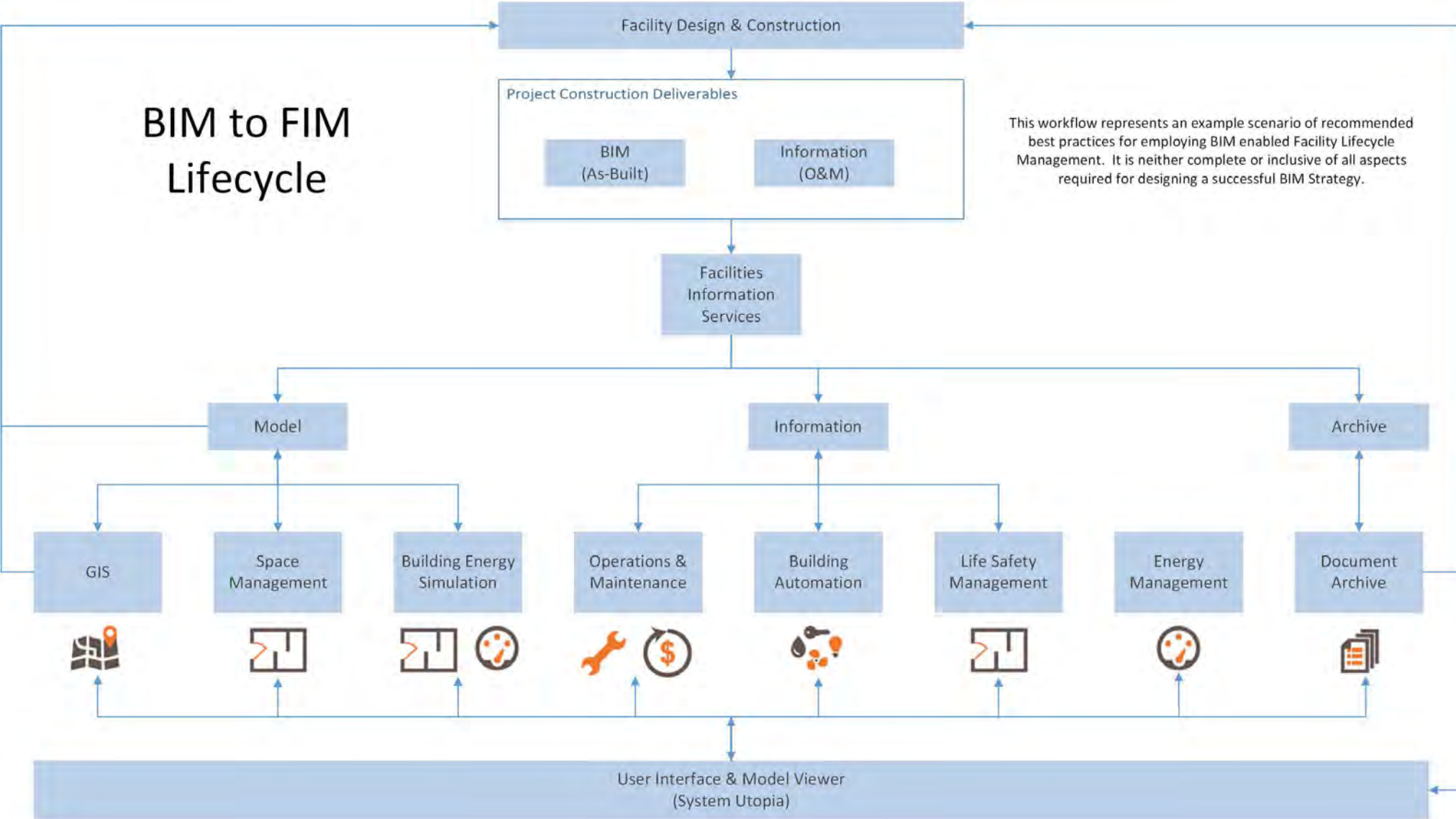


# Why BIM?

- Risk Mitigation
- Higher Quality
- Increased Productivity
- Streamlines Handover



# BIM – Architecture Strategy



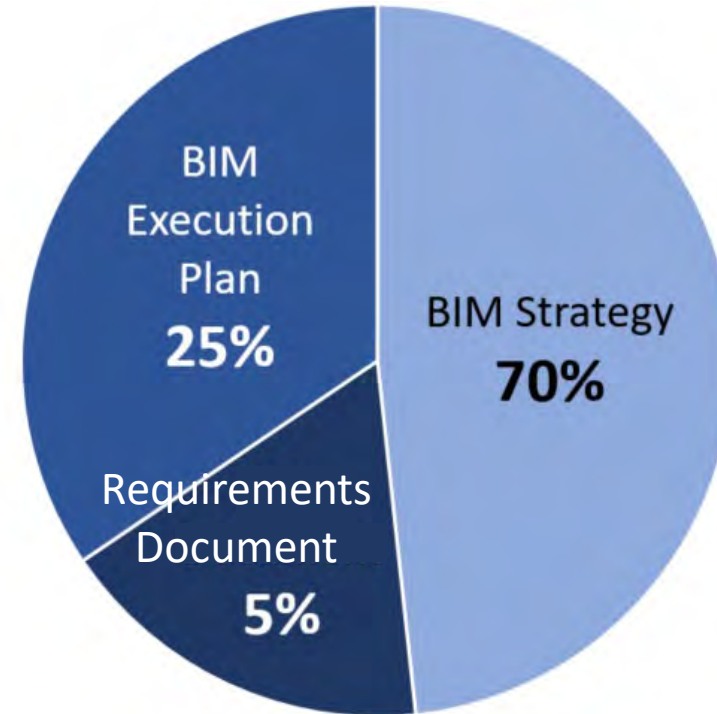
Developed in partnership between Messer Construction and the Campus FM Technology Association



# BIM – 3 Main Components

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- BIM Strategy
  - Define Goals & Metrics
  - Layout Tactics
  - Develop Roadmap
- Requirements Document
- BIM Execution Plan



*Other useful components include a feasibility study and “BIM 101” session for administrators*



# BIM – Level of Development (LOD)

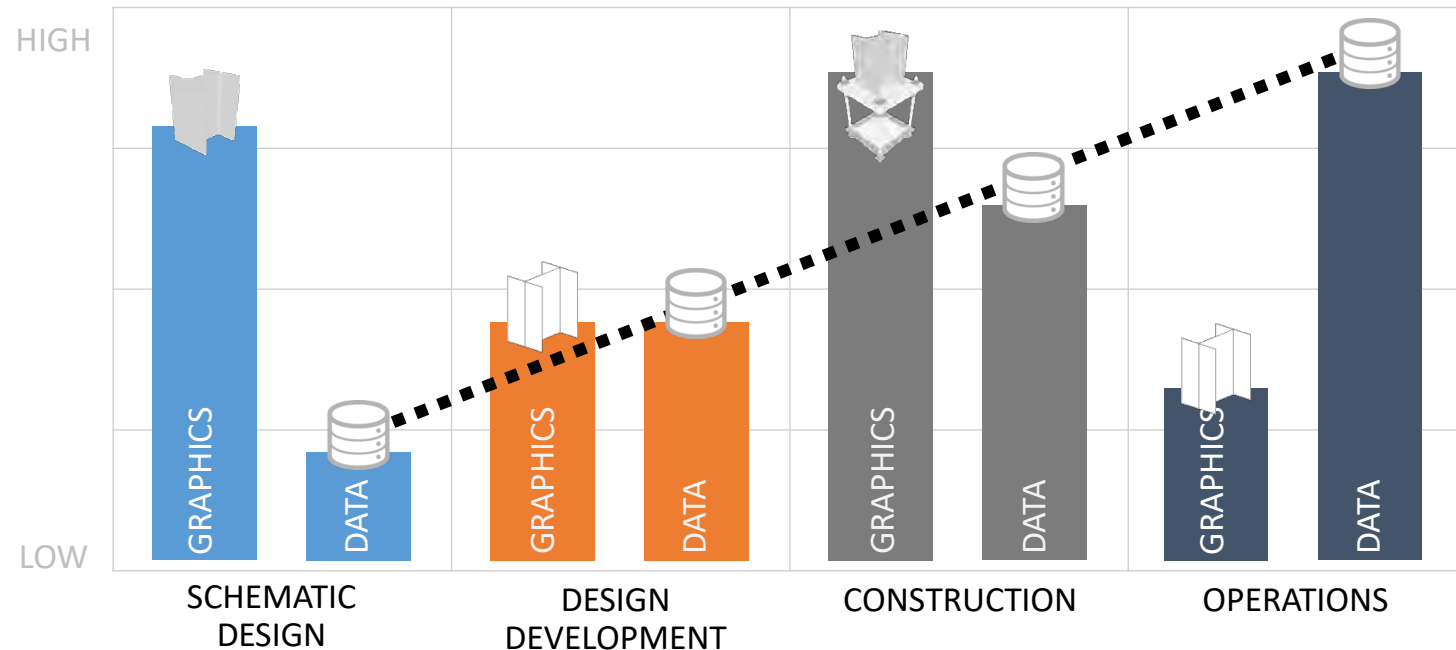
- Construction Needs

- Maximum graphics
- Minimum data

- Owner Needs

- Minimum graphics
- Maximum data

★ Avoid “Model Bloat” by determining what you don’t want in the model (BIM Strategy)



Graphic provided by:



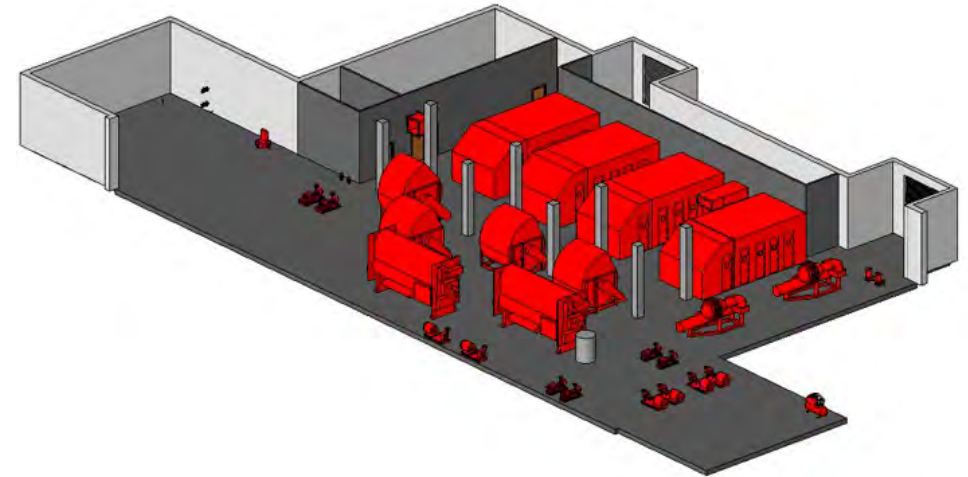
# Use Case: BIM

## Overriding Objective

- Streamline work order process for skilled trades personnel
- Improve information gathering process to ultimately save resources and increase efficiency across Operations Division

## Solution

- Modeled 150 campus building with high detail exterior, low detail interior
- Added mechanical equipment requiring routine maintenance to model
- Standardized critical CMMS attributes and information and automated flow from CMMS to BIM
- Removed information access barriers and replaced with visualization and planning tools
- ROI: Field verification reduced (less gas and time costs), facilities library staff time reduced (searching/printing), paper no longer needed





# Use Case: BIM

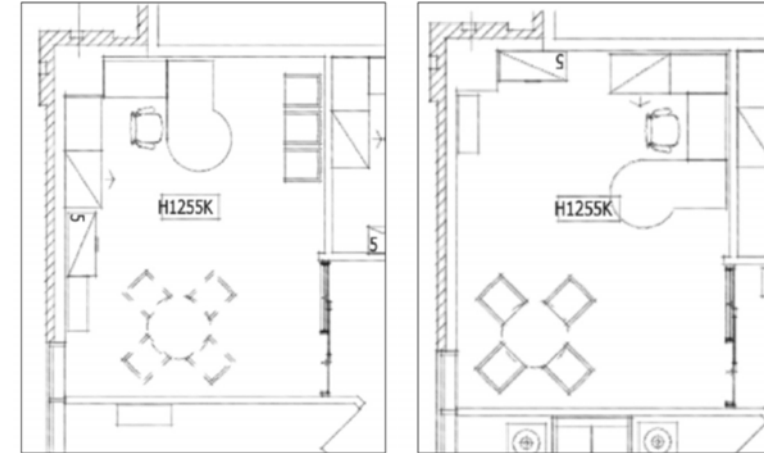
## Overriding Objective

- Enhance planning and communication resulting in improved quality and speed of decision-making
- Better quality and more current drawings and data; improved ability to communicate space data and design intent

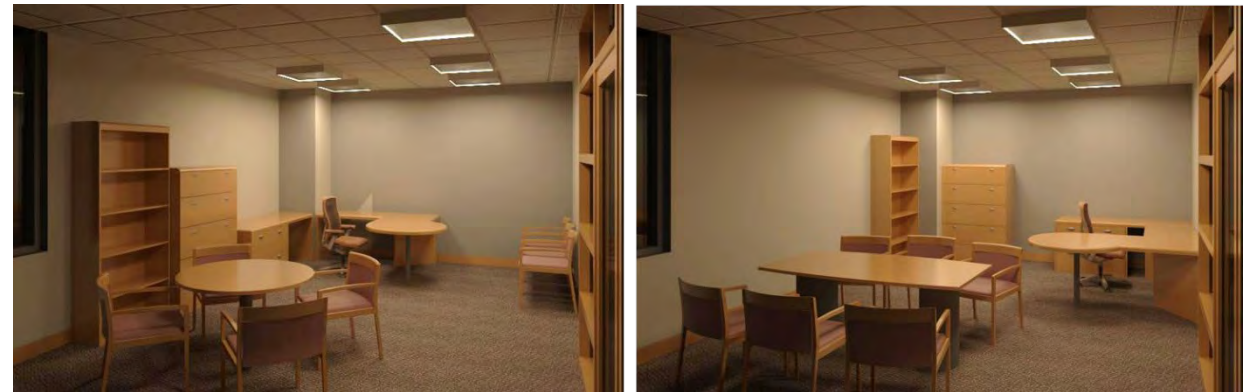
## Solution

- Customers easily share furniture layouts, minor renovations, signage, etc. in 3D without engaging consultant
- More effectively communicate office layout options to incoming senior leaders

*Before*



*After*





# BIM – Key Strategies

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- Establish Leadership (direction) and Department (data) Alignment
- Determine What “I” is Needed [\[Audit\]](#)
- Develop Roadmap
- Define Processes and Procedures (two way information exchange) [\[Process\]](#)
- Partner with IT
- Develop Design Deliverable Standards and System Standards [\[Standardize\]](#)
- Automate workflows [\[Automate\]](#)
- Outreach and Education



Graphic created by:





# IWMS – Integrated Workplace Management System

\ˈī-, ˈdə-bəl-(,)yü, ˈem, ˈes\

## IWMS is....

- A single platform software that streamlines processes for end-to-end facilities management
- Designed to offer robust reporting to define KPIs and strategically improve operations
- Consumes and gives meaning IoT big data
- Integrates five functional domains:  
Real Estate & Property Management | Facilities & Space Management  
Operations & Maintenance | Capital Planning & Project Management  
Energy Management & Sustainability

## IWMS is NOT...

- Just a CAFM
- A software for integrating silo systems
- GIS, BIM, or BAS (integration may require customization)

## IWMS is a CAFM plus

### Graphics

CAD

GIS

BIM

### Content

Space Management

Real Estate Planning

Project Management

Building Operations

Preventative  
Maintenance

Energy Management  
and Sustainability

### Functionality

Planning Tools

Performance Metrics

Integrated

Workflow

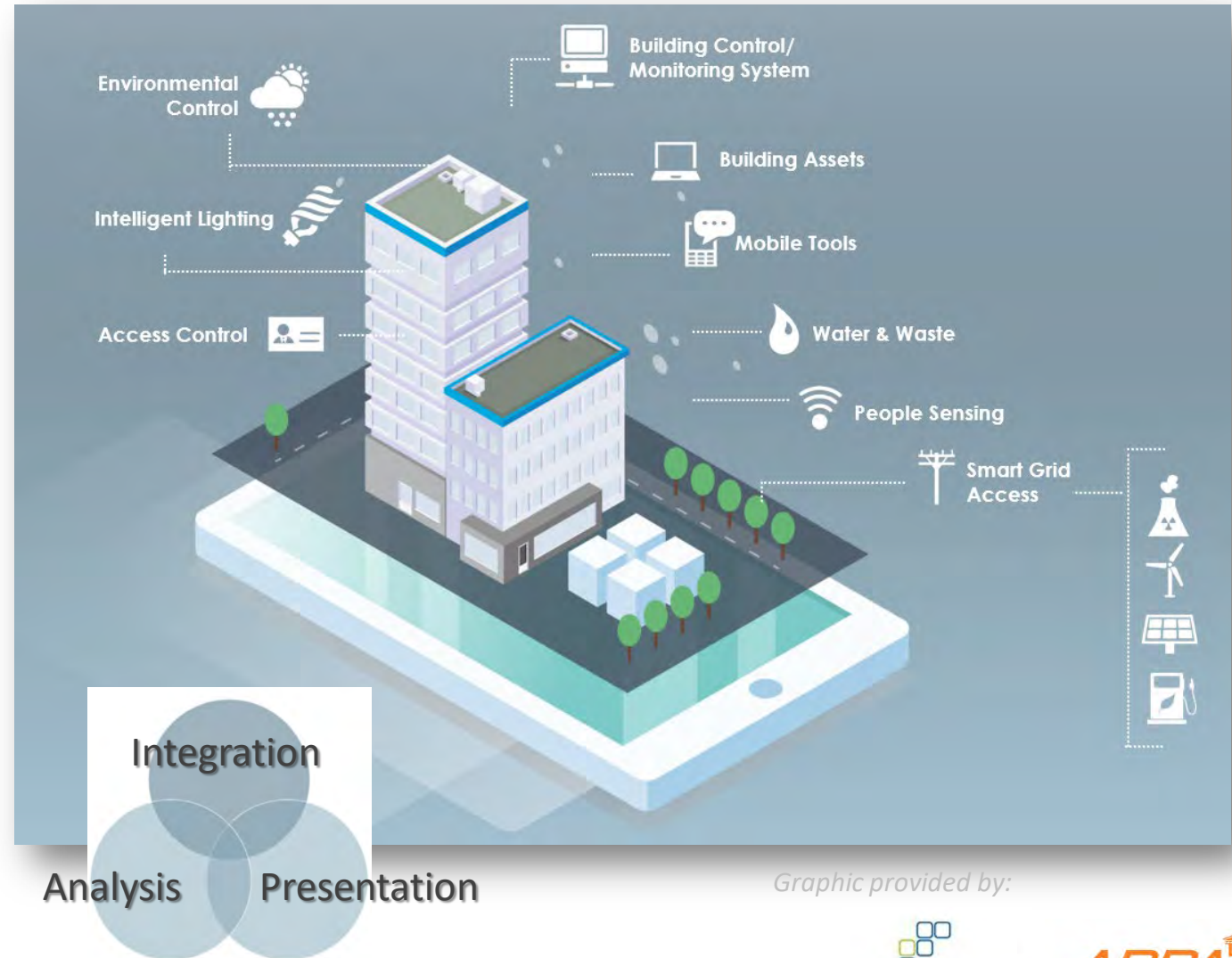
Advanced Functionality





# Why IWMS?

- Cost Containment
- Turns Data Into Information
- Data Drives Decisions  
Information → Optimization
- Enables Transition from Reactive  
WO State to Predictive
- Reduces Silo Systems



# IWMS – Participating Stakeholders



Graphic provided by:

FM:Systems

APPA  
LEADERSHIP IN EDUCATIONAL FACILITIES



# Use Case: IWMS

## Situation

Strict reporting requirements to the State and Federal government that determine funding for the institution and negotiation of the facility and administrative rate for federal grants.

## Result

IWMS implementation has allowed UNT to track locations of their research space and equipment and use it to associate grants to space and private investigators to help with both federal reporting and determination of productivity of existing research space.

**UNT OFFICE OF SPACE MANAGEMENT & PLANNING**

**Space Management**

**Sites**

- Manage Graphic Views
- Discovery Park
- Eagle Point Area
- Frisco Campus
- Kristin Farmer Autism Center
- Library Annex
- MAIN Campus**
  - 0001(Union Circle Parking Garage)
  - 0002(Highland Street Parking Garage)
  - 0101(Hurley Administration Bldg)
  - 0102(Auditorium-English Bldg)
  - 0103(Science Research Bldg)
  - 0104(Sage Hall)
  - 0106(Matthews Hall)
  - 0107(Curry Hall)
  - 0108(General Academic Bldg)
  - 0109(Hickory Hall)
  - 0111(Sycamore Hall)
  - 0112(Chemistry Bldg)
  - 0113(Eagle Student Services Center)
  - 0114(Science Research Building Storage)
  - 0115(Music Annex Building)
  - 0116(Ken Bahnsen Gym)
  - 0117(Physical Education Building)
  - 0118(Pohl Recreation Center)
  - 0119(Physics Bldg)
  - 0122(Bain Hall)
  - 0124(Music Practice North)
  - 0125(Music Practice South)

**HURLEY ADMINISTRATIVE BUILDING**  
BLDG #0101  
06-2016  
Exterior Gross Area 19237

**FIRST FLOOR PLAN**

**Floor Information**

Building	Bldg Name	Floor	Room #	Area	Assignable Area	Group	Room
0101	B0.BLDGCODE	01	102	271	271	151210	310
0101	B0.BLDGCODE	01	102A	252	252	151210	310
0101	B0.BLDGCODE	01	102AA	44	44	151210	245

**Area Information**

Gross Area	Assignable Area	History
19,237	11,115	

**1.10 Higher Education Survey- Admin**

Building	Building Name
<input type="checkbox"/> Edit 0313	Sullivant Public Safety Center
<input type="checkbox"/> Edit 0181	West Hall
<input type="checkbox"/> Edit 0185	Santa Fe Square Hall
<input checked="" type="checkbox"/> Edit 0140	Radio, TV, Film & Performing Arts
<input type="checkbox"/> Edit 0523	Facilities Warehouse 3
<input type="checkbox"/> Edit 0127	Music Bldg
<input type="checkbox"/> Edit 0187	Traditions Hall
<input type="checkbox"/> Edit 0108	General Academic Bldg
<input type="checkbox"/> Edit 0183	College Inn

Items 1 to 20 of 21310 Page: 1 of 1066 Go

**Room Details** Space Information Confirmation

Building 0140

Room 011

\* Department Correct? Yes

\* Space Use Correct? Yes

\* Room Dimensions Changed? No

Capacity 0

\* Required Field

Graphic provided by:





# Use Case: IWMS

## Situation

Wanted to improve control over maintenance practices with accurate, detailed records of reactive maintenance workload. Needed to measure effectiveness, identify capacity gaps, and connect internal and external trade engineers to help dispatch and execute work more efficiently.

## Result

System offers transparency into maintenance backlog, health & safety issues, compliancy risks, and capacity gaps and has moved from a reactive to preventative maintenance model. Maintenance backlog reduced by 50% within 3 months.



Graphic provided by:





# IWMS – Key Strategies

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- Identify Internal Champion
- Define Vision that Aligns with your Campus Mission and Values
- Define Realistic Scope and Strategic Roadmap
- Define Data Ownership and Workflows [\[Audit\]](#)
- Develop Process & Procedures [\[Process\]](#)
- Develop Standards [\[Standardize\]](#)
- Nurture Relationships
- Partner with IT
- Education & Outreach
- Open Visibility
- Configure Reports and Workflows [\[Automate\]](#)



Beware of systems that say they are an IWMS but aren't



# FIM Management Strategies

Lean Management | Continuous Improvement

Organizational Structure



# Lean

/lĕn/

## Lean is....

- A business methodology that promotes flow of value to the customer through two guiding tenets: Continuous improvement and respect for people
- Long-term management philosophy and organizational culture
- Heavily used in manufacturing, construction, and health care
- Multiple applications (*Lean Manufacturing, Lean Management, Lean Office, Lean Six Sigma...*)
- **Hard work and challenging to maintain**

## Lean is NOT...

- About tools but rather how they are applied
- About waste reduction but improving value
- About doing more with less but improving efficiency
- About cost reduction but finding better ways to work
- Rigid but creating a baseline for continuous improvement
- **Not easy to understand or implement**





# Why Lean?

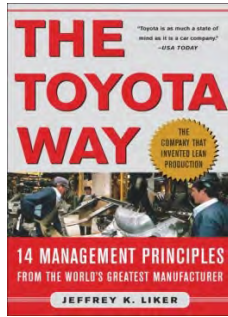
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- Process Improvement is Endless
- Propagates Change Management Mindset
- Employee Empowerment
- Scalable
- Long-term Sustainability
- It's the Right Thing (for the customer, for the employee, for the organization...)

# The Toyota Way

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*Note: many others are analyzing Lean in addition to Liker. TTW is just one example.*

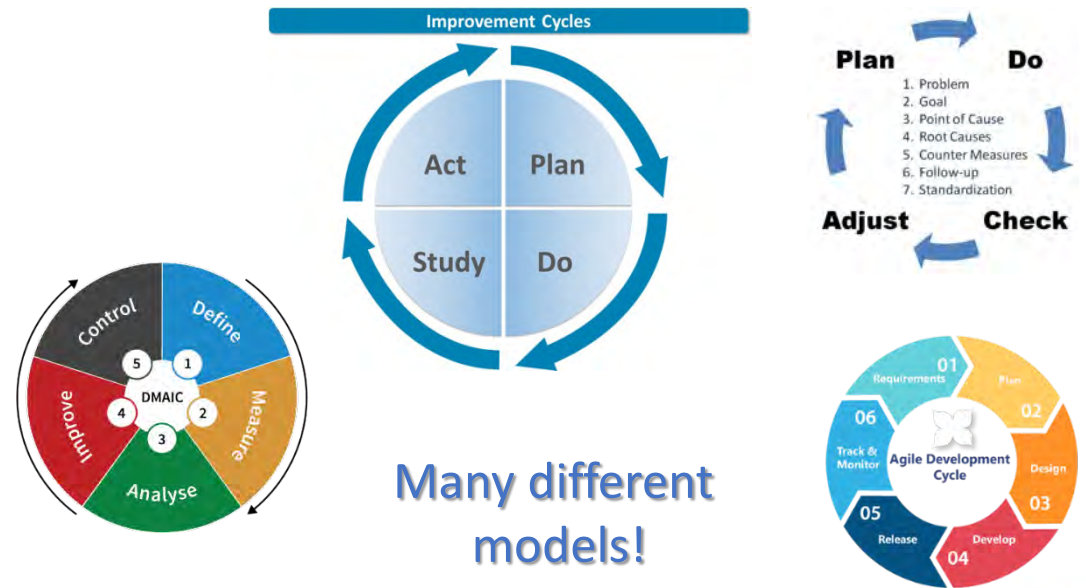
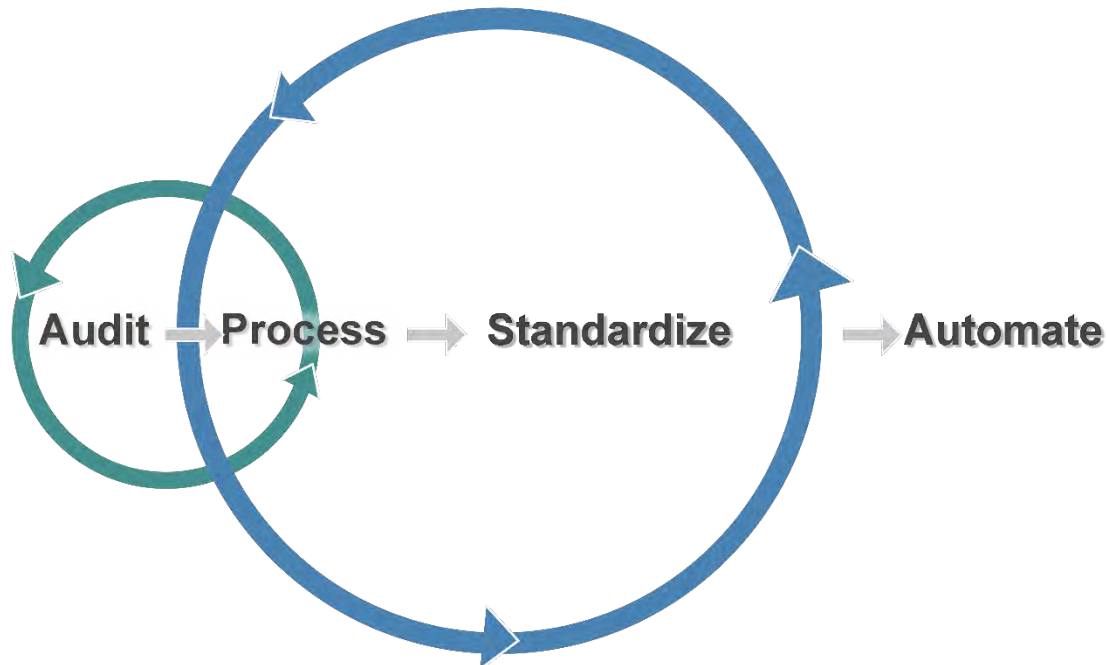


1. Base your management decisions on a **long-term philosophy**, even at the expense of short-term financial goals.
2. Create a **continuous process flow** to bring problems to the surface.
3. Use **“pull” systems** to avoid overproduction.
4. **Level out the workload** (work like the tortoise, not the hare).
5. Build a culture of **stopping to fix problems**, to get quality right the first time.
6. **Standardized** tasks and processes are the foundation for **continuous improvement** and employee engagement.
7. Use **visual controls** so no problems are hidden.
8. **Use only reliable, thoroughly tested technology** that serves your people and process.
9. **Grow leaders** who thoroughly understand the work, live the philosophy, and teach it to others.
10. **Develop exceptional people and teams** who follow your company’s philosophy.
11. **Respect your extended network of partners** and suppliers by challenging them and helping them improve.
12. **Go and see for yourself** to thoroughly understand the situation.
13. **Make decisions slowly by consensus**, thoroughly considering all options; implement decisions rapidly.
14. **Become a learning organization** through **relentless reflection** and continuous improvement.

# Lean – Nuts & Bolts

*Note: criteria listed represent a subset of available items under the four (4) Nuts and Bolts steps and are listed for discussion purposes only.*

- |  |  |   |  |
|--|--|---|--|
| <b>1</b> <u>Audit</u> <ul style="list-style-type: none"><li>• Information</li><li>• Data</li><li>• Systems</li><li>• Resources</li><li>• Outputs</li><li>• Processes</li></ul> | <b>2</b> <u>Process</u> <ul style="list-style-type: none"><li>• Workflow diagrams</li><li>• Support documentation</li><li>• Checklists</li><li>• Request forms</li></ul> | <b>3</b> <u>Standardize</u> <ul style="list-style-type: none"><li>• Libraries</li><li>• Templates</li><li>• Technical Standards</li><li>• Design Standards</li><li>• Manuals</li><li>• Policies</li></ul> | <b>4</b> <u>Automate</u> <ul style="list-style-type: none"><li>• Desktop tools</li><li>• Web applications</li><li>• Mobile apps</li><li>• System integrations</li><li>• Report generation</li><li>• Other customizations</li></ul> |
|--|--|---|--|







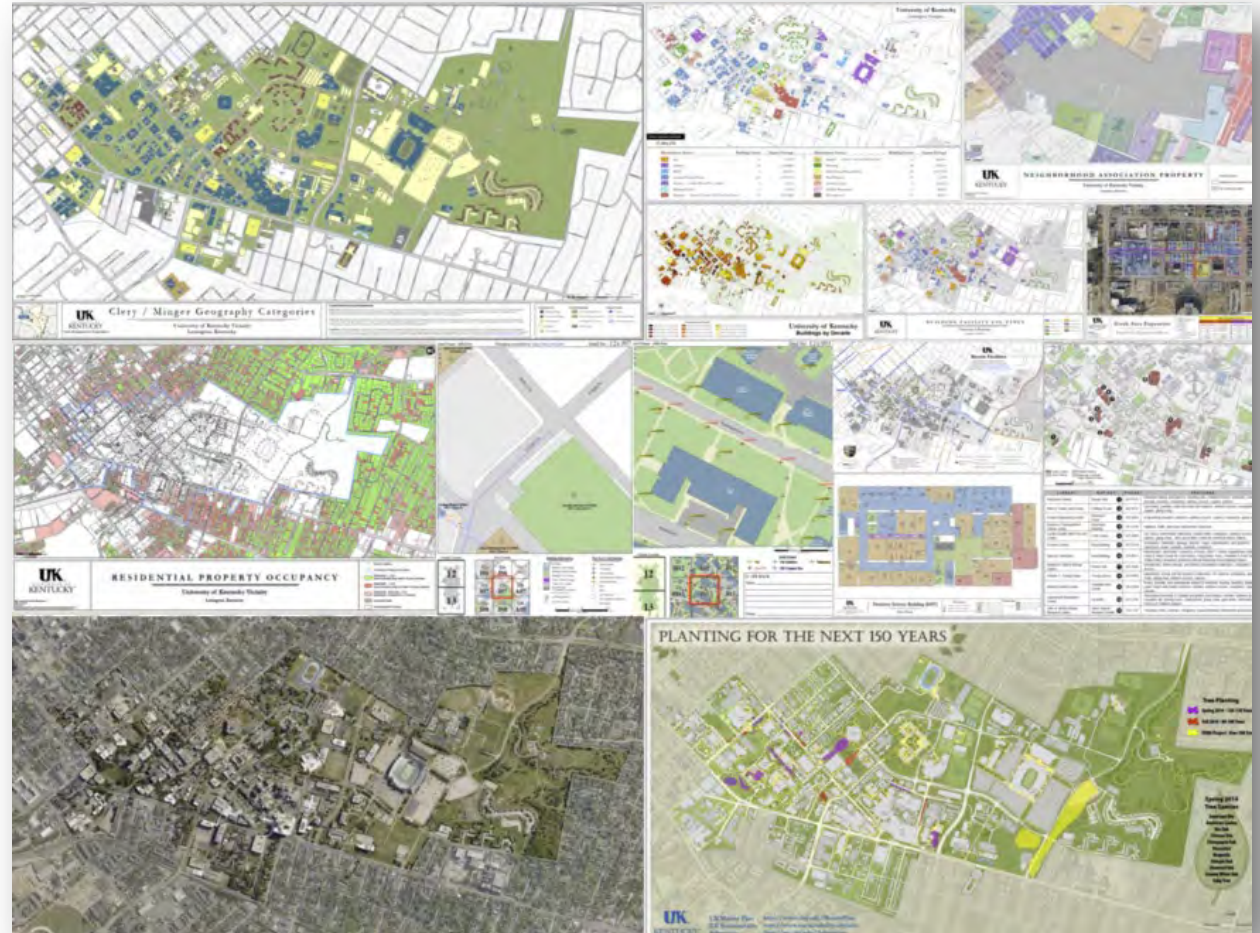
# Use Case: Lean Office

## Situation

100's of map requests at varying times throughout the year with various levels of urgency. Many last minute submitted by email or walk-in. Time consuming to make and hard to find errors. Required technical expertise and extensive PM to ensure quality and customer service expectations were met.

## Result

Developed standards, templates, workflows, and training pathways to level out the workload and enable student workers with no mapping experience to develop 75% of recurring map requests. Developed self-service solutions for end users to develop maps of interest and access information.



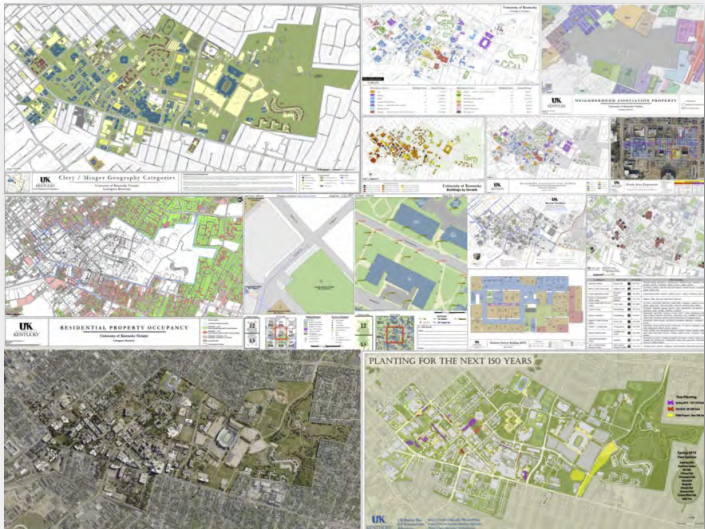




# Use Case: Lean Office

## 1 Audit

Document past three years of map products and look for common trends in sizes, colors, map elements, request times, recurring tasks, errors...



Size	Orientation	Style	Collar	Base Map	Color
8.5x11	Portrait Landscape	Decorative Utility Planning Space Usage Map Book	Top Bottom Floating	2D 2.5 D Aerial	Grey Black/White Blue/Green Blue/Grey Lime/Peach Tan/Green Green/Green
11x17	Portrait Landscape	Decorative Utility Planning Space Usage Map Book	Top Bottom Floating	2D 2.5 D Aerial	Grey Black/White Blue/Green Blue/Grey Lime/Peach Tan/Green Green/Green
24x36	Portrait Landscape	Decorative Utility Planning Space Usage Map Book	Top Bottom Floating	2D 2.5 D Aerial	Grey Black/White Blue/Green Blue/Grey Lime/Peach Tan/Green Green/Green
Custom (i.e. 28x46, 54.5x30)	Portrait Landscape	Decorative Utility Planning Space Usage Map Book	Top Bottom Floating	2D 2.5 D Aerial	Grey Black/White Blue/Green Blue/Grey Lime/Peach Tan/Green Green/Green

### Map Elements:

- Line Weights
- Margins
- Font
- North Arrow
- Scale Bar
- Scale
- Neat Line
- Rev Date
- Data Source
- Created by:
- Labels
- Symbol
- Color Schemes
- Symbol Library
- DRAFT
- Legend
- Grid

### Style key

- Decorative: Double, Graded neat line
- Utility: Same as above or solid line
- Planning: Rounded frame
- Space Usage: Existing format
- Map Book: Utility or decorative format



## 2 Process

**GIS Services**  
**Map Development Project Workflow**

**Legend:**

- Project Phases:** Map Request, Map Development, Project Finalization
- High Priority Event:** (Blue diamond)
- Form Required:** (Green parallelogram)
- Customer Interaction:** (Pink trapezoid)
- Map Request Environment:** (Light blue background)
- Map Development Environment:** (Light green background)
- Project Finalization Environment:** (Light yellow background)
- Supervisor & TA Role:** (Pink background)
- GIS Personnel Role:** (Light green background)

**Map Request Phase:**

- Map Request (C)
- Is this a high priority request? (Decision)
- If YES: Request given to Supervisor or TA? (Decision)
  - YES: Create and deliver map (C)
  - NO: Include Supervisor, if possible (C)
- Statement of Work Request Form (F) SOW-RF
- Request is recorded and passed to GIS Supervisor or TA (C)
- Statement of Work Form (F) SOW
- Supervisor or TA prepares SOW and assigns it to GIS personnel (C)
- Project is added to GIS Project Calendar (C)

**Map Development Phase:**

- Map Development (C)
- First DRAFT Map Development (C)
  - DRAFT graphic added to map (C)
  - DRAFT added to PDF file name (C)
  - Map Review Form (F) MRF (1st Review Stage)
  - MRF used to check map until no more changes are identified (C)
  - Does map pass review? (Decision)
    - YES: Map & MRF given to Supervisor/TA (C)
    - NO: Map & MRF given to GIS Personnel (C)
  - Supervisor/TA emailed path to file and notified the map is ready to review (C)
  - Does map pass review? (Decision)
    - YES: Map & MRF given to Supervisor/TA (C)
    - NO: Map & MRF given to GIS Personnel (C)
- Second DRAFT Map Development (C)
  - DRAFT graphic remains on map (C)
  - DRAFT remains on PDF file name (C)
  - Map Review Form (F) MRF (2nd Review Stage)
  - MRF used to check map until no more changes are identified (C)
  - Does map pass review? (Decision)
    - YES: Map & MRF given to Supervisor/TA (C)
    - NO: Map & MRF given to GIS Personnel (C)
  - Supervisor/TA emailed path to file and notified the map is ready to review (C)
  - Does map pass review? (Decision)
    - YES: Map & MRF given to Supervisor/TA (C)
    - NO: Map & MRF given to GIS Personnel (C)

**Map Finalization Phase:**

- Map Finalization (C)
  - Supervisor and TA emailed path to map file (C)
  - DRAFT removed from PDF file name (C)
  - DRAFT removed from map (C)
  - Project Finalization - Bypass - (C)
  - Finalization Bypass requested of GIS Personnel (C)
  - Map Review Form (F) MRF (Project Finalization)
  - Map delivered to Customer (C)
  - Map delivered to Customer (C)
  - DRAFT removed from map (C)
  - DRAFT removed from PDF file name (C)
  - Project Finalization section in MRF and SOW completed (C)
  - SOW and MRF scanned and filed in Documents folder (C)
  - Original SOW and MRF given to Supervisor/TA (C)
  - Final DRAFT copy given to Supervisor/TA (C)
  - Supervisor and TA emailed path to map file and notified the project is completed (C)
  - Finalization bypass requested by customer? (Decision)
    - YES: Map delivered to Customer (C)
    - NO: Map delivered to Customer (C)

**Project Complete:**

Project Complete (C)





# Use Case: Lean Office

1

## Audit

Document past three years of map products and look for common trends in sizes, colors, map elements, request times, recurring tasks, errors...

2

## Process

Workflow diagram, QC form, PM map request tracking process...

UK FIS - Map Review Form	
Project Name: _____	
Start Date: _____	
DRAFT Review Stage	
<input type="checkbox"/> 1st Revision #: 1 2 3 4 (A)	
<input type="checkbox"/> 2nd Revision #: 1 2 3 4 (A)	
<b>Cartographic Elements</b>	<b>Date/Contact</b>
<b>Neatline</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Placement - Equal margins to neatline/map edge on all sides
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Placement - Within printable margins	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Email Address included - Geospatial.Requests@uky.edu
<b>Title and Tables</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Accuracy - Dynamic Revision Date
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Placement - Title within printable margins, centered	<b>Legend</b>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Content - Static tables updated with current data	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Placement - Equal margins to neatline/map edge on all sides
<b>North Arrow</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Accuracy - Features/Symbols in legend match features/symbols in map
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Placement - Equal margins to neatline/map edge on all sides	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Order - Point, line, poly - logical groups, alphabetized
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Accuracy - Direction	<b>Source</b>
<b>Scale Bar</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Placement - Equal margins to neatline/map edge on all sides
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Placement - Equal margins to neatline/map edge on all sides	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Accuracy - Type, Date,...
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Accuracy - One inch measurement	<b>Mapping Elements</b>
<b>Data Frame</b>	<b>Table of Contents</b>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Meaningful Scale	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Source - All features sourced correctly to project gdb or enterprise
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Data sets fill data frame extents	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Pertinent layers turned on
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Add Map View Bookmark	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Label layers created/feature layers not labeled
<b>Text Labels / Annotation / Graphics</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Auto labels turned on - Check Label Manager, check Scale Range
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Clarity - Poor placement, obstructed by legend	<b>Results and Computations</b>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Logo - New Logo added to products	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Tables and Map elements are 1:1 (TOC summaries matches Data View information)
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> DRAFT - Added to all draft products	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Graphics - Spatial graphics located in data frame	
<b>Cartographic Outputs</b>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> PDF QC - check for errors, resolution, symbol conversion (iPad Check if needed)
<b>Export</b>	<b>Print</b>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> PDF Resolution - 300 dpi, 1:1 Ratio	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Printed QC - Final print QC performed from printed PDF, not from printed MXD
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> PDF Layers - Apply as needed	
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> PDF Compressed - optimized OR print driver	
<b>ITEMS BELOW FOR PROJECT FINALIZATION ONLY</b>	
<b>MXD</b>	<b>Geodatabase</b>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Cleanup - Unused features removed from TOC	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Cleanup - Unused feature classes removed
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Cleanup - Clear geoprocessing window	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Name - Names adhere to departmental standards
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Name - Name adheres to departmental standards	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Compacted - Reduce file size
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Organization - Unwanted MXDs deleted	<b>Final Map Product</b>
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> UGIS Reporter - Run UGIS Reporter	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> "DRAFT" graphic removed from map and re-exported
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> Source - Feature classes sourced using the PowerReader database connection	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> "DRAFT" removed from PDF file name
Reviewer: _____	
Completed By: _____ End Date: _____ <input type="checkbox"/> <input type="checkbox"/> Issues on Back	

REV 20151123



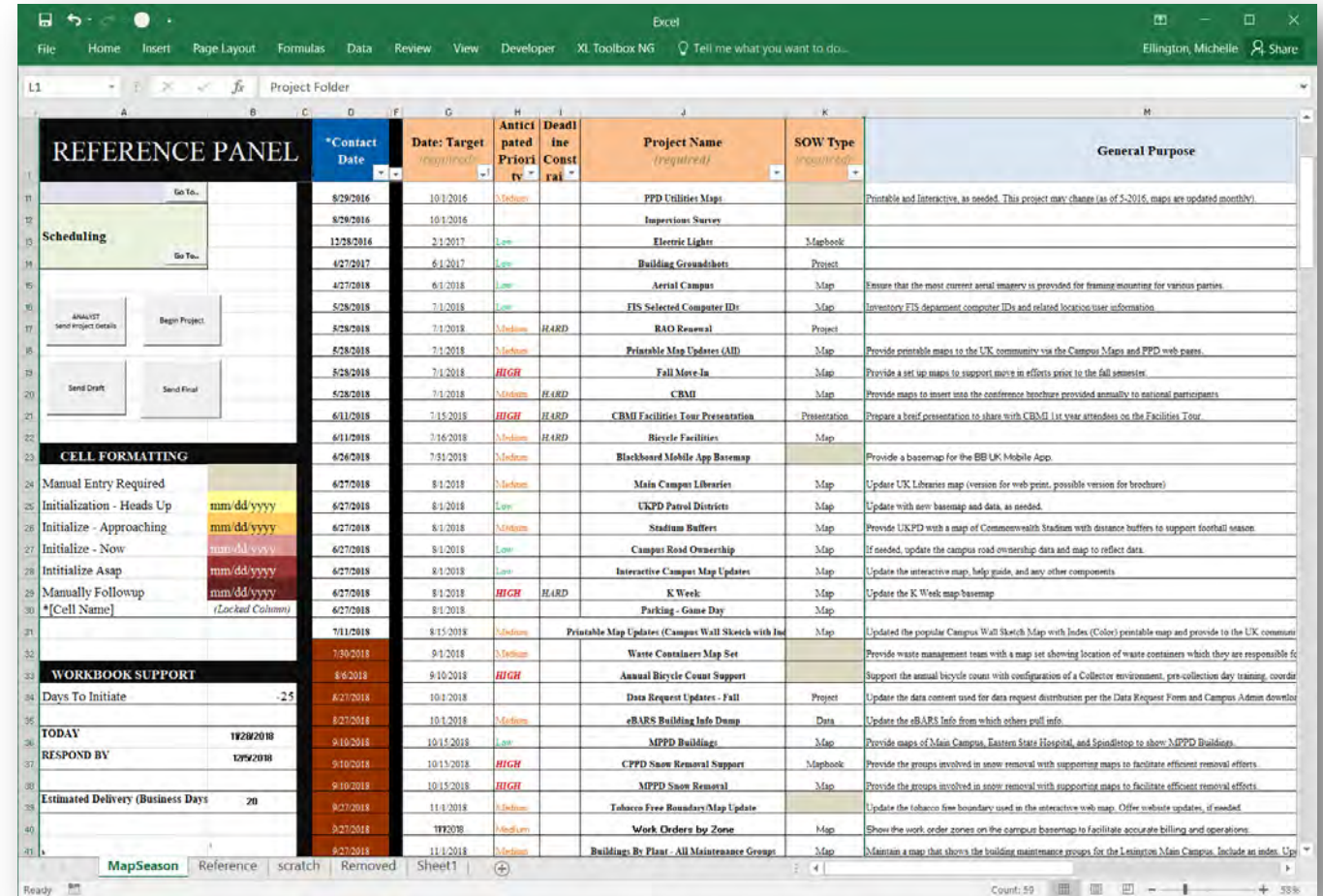
# Use Case: Lean Office

## 1 Audit

Document past three years of map products and look for common trends in sizes, colors, map elements, request times, recurring tasks, errors...

## 2 Process

Workflow diagram, QC form, PM map request tracking process...



*Contact Date	Date: Target	Anticipated Priority	Deadline	Project Name (required)	SOW Type (required)	General Purpose
8/29/2016	10/1/2016	Medium		PPD Utilities Maps		Printable and interactive, as needed. This project may change (as of 5-2016, maps are updated monthly)
8/29/2016	10/1/2016			Inspection Survey		
12/28/2016	2/1/2017	Low		Electric Lighter	Mapbook	
4/27/2017	6/1/2017	Low		Building Groundshots	Project	
4/27/2018	6/1/2018	Low		Aerial Campus	Map	Ensure that the most current aerial imagery is provided for time-slicing for various parties.
5/28/2018	7/1/2018	Low		FIS Selected Computer IDs	Map	Inventory FIS department computer IDs and related location/user information
5/28/2018	7/1/2018	Medium	HARD	BAO Renewal	Project	
5/28/2018	7/1/2018			Printable Map Updates (AM)	Map	Provide printable maps to the UK community via the Campus Maps and PPD web pages.
5/28/2018	7/1/2018	HIGH		Fall Move-In	Map	Provide a set up maps to support move-in efforts prior to the fall semester.
5/28/2018	7/1/2018	Medium	HARD	CBMI	Map	Provide maps to insert into the conference brochure provided annually to national participants
6/11/2018	7/15/2018	HIGH	HARD	CBMI Facilities Tour Presentation	Presentation	Prepare a brief presentation to share with CBMI 1st year attendees on the Facilities Tour
6/11/2018	7/16/2018	Medium	HARD	Bicycle Facilities	Map	
6/26/2018	7/31/2018	Medium		Blackboard Mobile App Basemap		Provide a basemap for the BB UK Mobile App.
6/27/2018	8/1/2018	Medium		Main Campus Libraries	Map	Update UK Libraries map (version for web print, possible version for brochure)
6/27/2018	8/1/2018	Low		UKPD Patrol Districts	Map	Update with new basemap and data, as needed.
6/27/2018	8/1/2018	Medium		Stadium Buffers	Map	Provide UKPD with a map of Commonwealth Stadium with distance buffers to support football season.
6/27/2018	8/1/2018	Low		Campus Road Ownership	Map	If needed, update the campus road ownership data and map to reflect data.
6/27/2018	8/1/2018	Low		Interactive Campus Map Updates	Map	Update the interactive map, help guide, and any other components
6/27/2018	8/1/2018	HIGH	HARD	K Week	Map	Update the K Week map/basemap
6/27/2018	8/1/2018			Parking - Game Day	Map	
7/11/2018	8/15/2018	Medium		Printable Map Updates (Campus Wall Sketch with Index)	Map	Updated the popular Campus Wall Sketch Map with Index (Color) printable map and provide to the UK community
7/30/2018	9/1/2018	Medium		Waste Containers Map Set		Provide waste management team with a map set showing location of waste containers which they are responsible for
8/6/2018	9/10/2018	HIGH		Annual Bicycle Count Support		Support the annual bicycle count with configuration of a Collective environment, pre-collection day training, coordinate
8/27/2018	10/1/2018			Data Request Updates - Fall	Project	Update the data content used for data request distribution per the Data Request Form and Campus Admin download
8/27/2018	10/1/2018	Medium		eBARS Building Info Dump	Data	Update the eBARS info from which others pull info
9/10/2018	10/15/2018	Low		MPPD Buildings	Map	Provide maps of Main Campus, Eastern State Hospital, and Spaulding to show MPPD Buildings.
9/10/2018	10/15/2018	HIGH		CPFD Snow Removal Support	Mapbook	Provide the groups involved in snow removal with supporting maps to facilitate efficient removal efforts
9/10/2018	10/15/2018	HIGH		MPPD Snow Removal	Map	Provide the groups involved in snow removal with supporting maps to facilitate efficient removal efforts
9/27/2018	11/1/2018	Medium		Tobacco Free Boundary/Map Update		Update the tobacco free boundary used in the interactive web map. Offer website updates, if needed.
9/27/2018	11/2/2018	Medium		Work Orders by Zone	Map	Show the work order zones on the campus basemap to facilitate accurate billing and operations
9/27/2018	11/2/2018	Medium		Buildings by Floor - All Maintenance Groups	Map	Maintain a map that shows the building maintenance groups for the Lexington Main Campus. Include an index. Up





# Use Case: Lean Office

## 1 Audit

Document past three years of map products and look for common trends in sizes, colors, map elements, request times, recurring tasks, errors...



## 2 Process



Workflow diagram, QC form, PM map request tracking process...



## 3 Standardize

Color styles, templates, quality...

UGIS LayerFile Reference				
LayerFile ID	Building Color	Building RGB	Campus Color	Campus RGB
blackwhite1	white	255, 255, 255	white	255, 255, 255
bluegreen1	blue	26, 94, 129	green	163, 188, 150
bluegreen2	blue	0, 83, 141	green	180, 215, 158
greycree1	grey	220, 220, 220	green	134, 156, 84
greycree2	grey	156, 156, 156	grey	235, 235, 235
greycree3	grey	104, 104, 104	grey	143, 143, 143
tangreen1	tan	255, 237, 209	green	228, 244, 223
AllUtilities1	N/A	N/A	N/A	N/A
ExtentIndicator1	N/A	N/A	white	255, 255, 255

UGIS LayerFile Thumbnail Reference		
Color ID	Type	Thumbnail Image
blackwhite1	Base Map	
	Perspective	

UGIS LayerFile Thumbnail Reference		
Color ID	Type	Thumbnail Image
bluegreen1	Base Map	
	Perspective	

UGIS LayerFile Thumbnail Reference		
Color ID	Type	Thumbnail Image
greycree1	Base Map	
	Perspective	



# Use Case: Lean Office

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## 2 Process

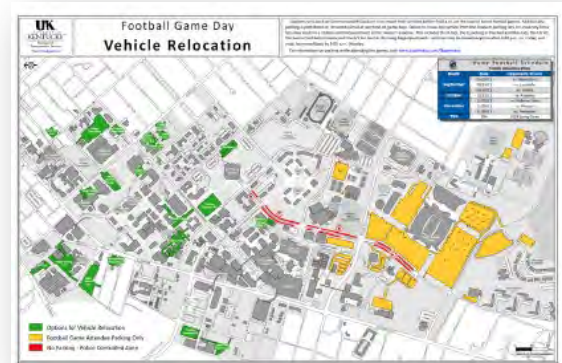
Workflow diagram, QC form, PM map request tracking process...

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Color styles, templates, quality...



L\_Decorative\_BottomCollar\_8.5x11



L\_Planning\_TopCollar\_11x17



4Panel\_Portrait\_8.5x11\_4





# Use Case: Lean Office

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### Map Quality Standards

#### Purpose

To ensure balance between map development quality and efficiency

#### Quality Control

Items that pertain to ALL map products:

- MRF Usage
- Clear Information
- Client Satisfaction
- Template Deviations reviewed by the GIS Coordinator

#### High Priority Requests

If the required reviewers are not available and there is a deadline, handle by requesting a review from someone at the same level or above. For example, if the GIS Analyst is not available then the Coordinator can review. If the Cartographic Lead is not available, then the GIS Analyst can review.

Quality	High	Medium	Low
General Criteria	Publication Grade	Working/Planning Map	Working/Planning Map
Example Products	<ul style="list-style-type: none"> <li>• Visitor Map</li> <li>• Brochures</li> </ul>	<ul style="list-style-type: none"> <li>• Work Order Zones</li> <li>• Parcel Map (for reference)</li> </ul>	<ul style="list-style-type: none"> <li>• Custodial Teams</li> <li>• Parcel/Utilities AOI (quick)</li> </ul>
Minimum Reviews	1. PM 2. TA 3. Cartographic Lead 4. GIS Analyst -or- GIS Coordinator	1. PM 2. TA 3. Cartographic Lead	1. PM 2. Cartographic Lead
Comments		<ul style="list-style-type: none"> <li>• Standard Map Request</li> <li>• Default Quality</li> </ul>	<ul style="list-style-type: none"> <li>• "15 Minute Map"</li> <li>• Must Use Existing Templates</li> </ul>



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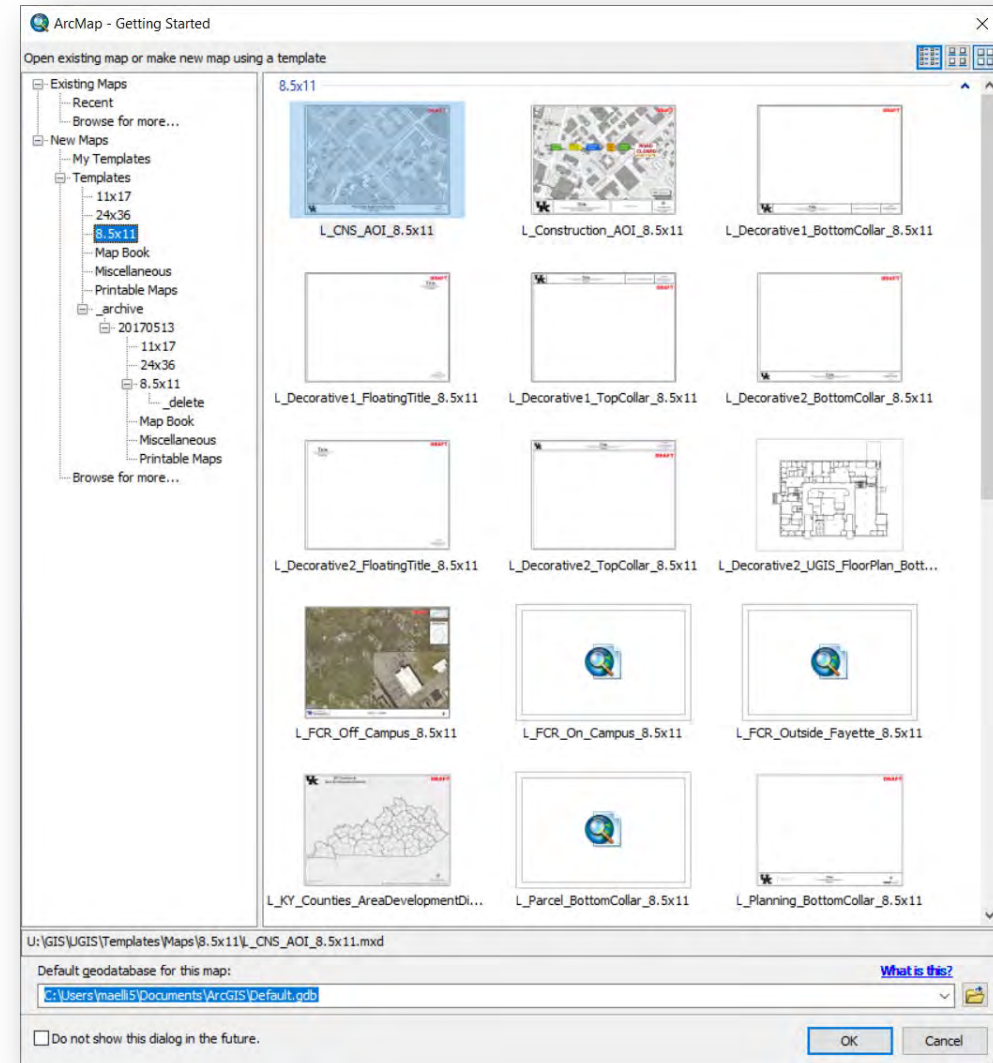
Workflow diagram, QC form, PM map request tracking process...

## 3 Standardize

Color styles, templates, quality...

## 4 Automate

Desktop application customization, PM Dashboard, web and map tools...





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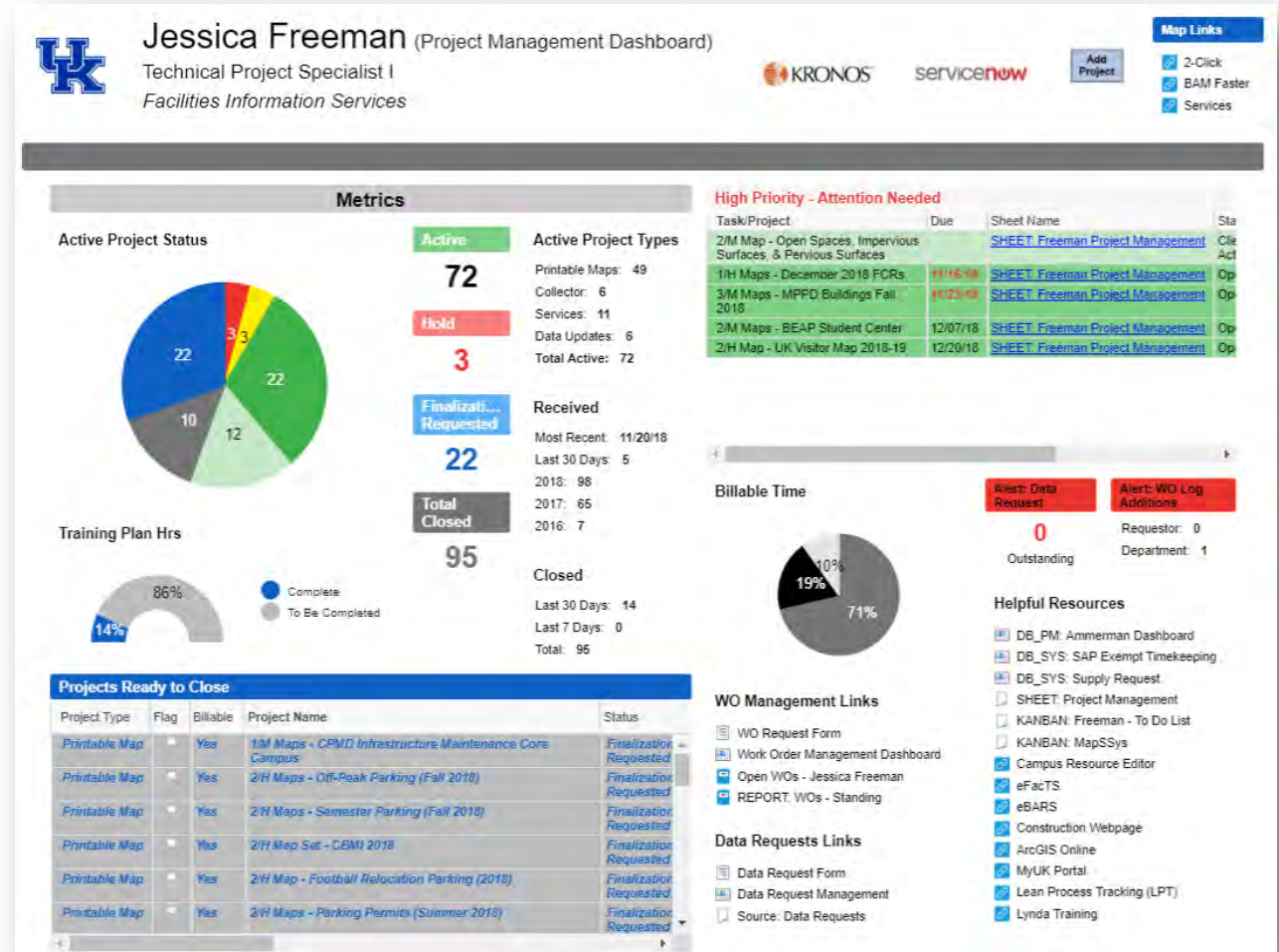
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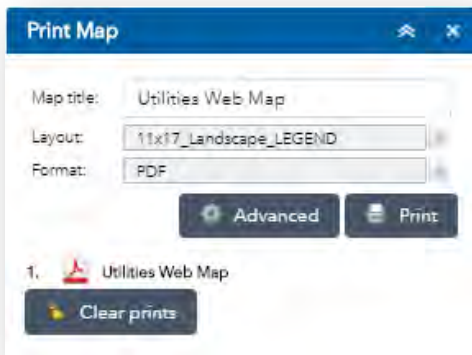
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**Floor Plan File Formats**

**0676-Bill Gatton Student Center**

<a href="#">Floor Plan PDF</a>	6MB
<a href="#">AutoCAD Drawing</a>	30MB <small>(Requires Authorization)</small>
<a href="#">Square Footage Index</a>	



Building - Level - Space			Bill Gatton Student Center [0676]		
FunctionalLocation	Level	Label	NSF	Assignability	
UK-0676-01-A0100A	01	A100A	1,737	Non-Assignable	
UK-0676-01-A0100A1	01	A100A1	129	Non-Assignable	
UK-0676-01-A0100B	01	A100B	3,284	Non-Assignable	
UK-0676-01-A0100B1	01	A100B1	905	Non-Assignable	
UK-0676-01-A0100C	01	A100C	2,486	Non-Assignable	
UK-0676-01-A0100C1	01	A100C1	214	Non-Assignable	
UK-0676-01-A0100F	01	A100F	1,271	Non-Assignable	
UK-0676-01-A0100J1	01	A100J1	295	Non-Assignable	
UK-0676-01-A0100K	01	A100K	2,815	Non-Assignable	
UK-0676-01-A0100K1	01	A100K1	423	Non-Assignable	
UK-0676-01-A0100L	01	A100L	628	Non-Assignable	
UK-0676-01-A0110	01	A110	9,703	Assignable	
UK-0676-01-A0110A	01	A110A	522	Assignable	
UK-0676-01-A0110B	01	A110B	696	Assignable	
UK-0676-01-A0110C	01	A110C	925	Assignable	
Building	Level	Space	REFERENCE	+	

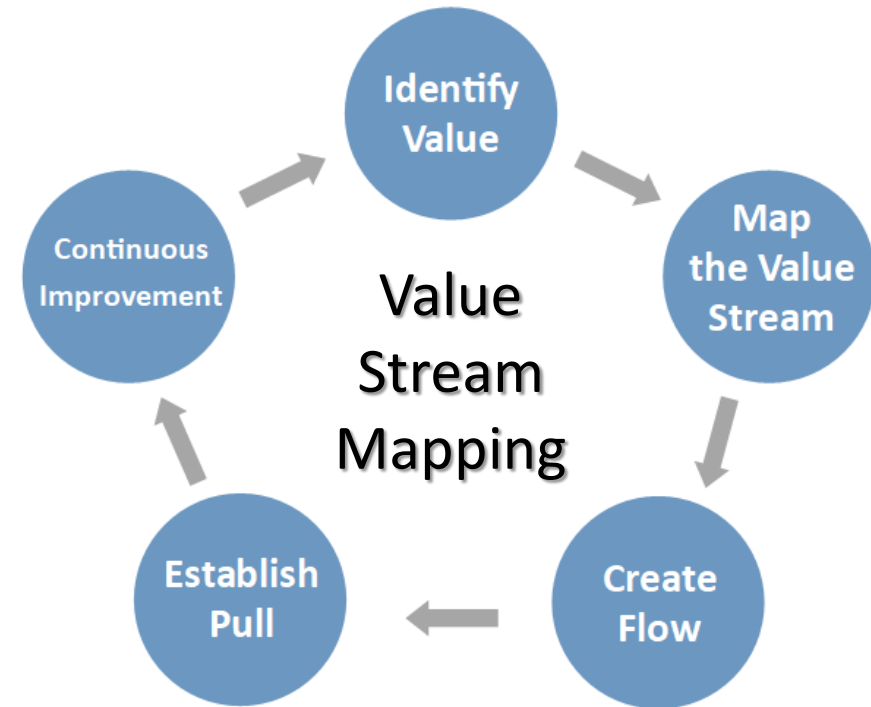




# Lean – Key Strategies

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- Requires Top-Down Support
- Prepare People for Change
- Introduce Lean Principles
- Small Cycles of Change
- Use “Lean Nuts and Bolts” as a Beacon
- Reward Effort
- Celebrate Achievements



# Organization Management Strategy

- Information Services Area
- System Technologists
- System and Data Governance
- Operational Standards
- Multiple Funding Sources
- Customer Service Driven
- Facilities Processes Include Support From Information Services Area
- Empower Leadership

# Organization Management Strategy

## Facilities Information Services (FIS)

*This org chart represents one recommendation of a facilities information services department structure. It is neither complete or inclusive of all position types or information areas required for successful FIM execution.*

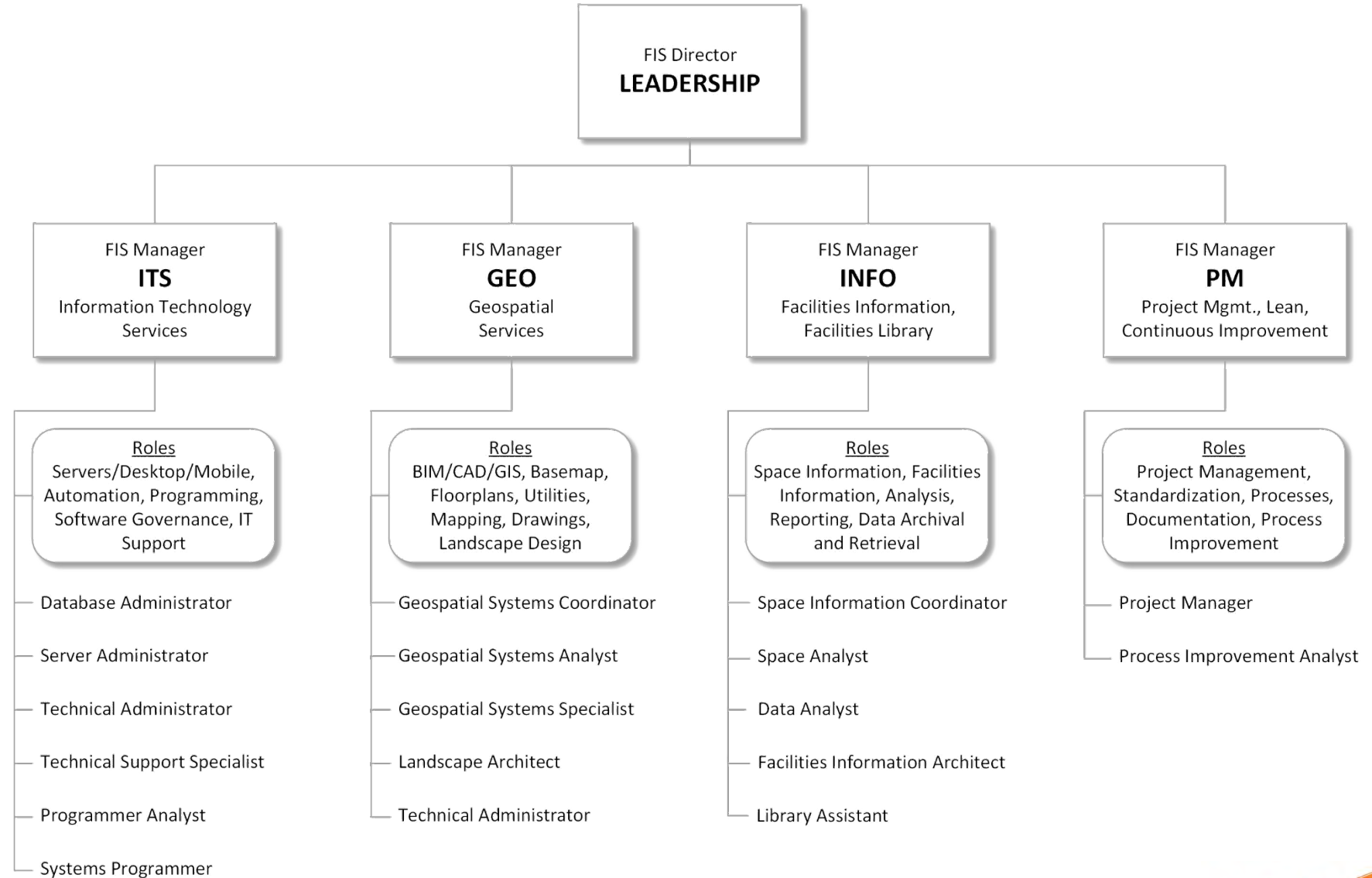


Image Credit: Developed in partnership between the University of Kentucky, Weber State University, and The Ohio State University

# Achieving FIM Excellence: Conclusion

Digital Transformation & Smart Campus Design

Final Thoughts

Contributing Thought Leaders



# Achieving FIM – Digital Transformation & Smart Campus Design



80% of people who are in a digital transformation process say improving processes that expedite changes is their top initiative. 63% say that culture is the number one barrier.

- Results from  
*The 2014 State of Digital Transformation Survey*

# Final Thoughts

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- Marathon Not a Sprint
- 90% Planning | 10% Implementation
- Apply *Good to Great* Concepts
- Put Your Best People On Your Biggest Opportunities
- Start Small
- Partner With IT
- Be a Champion



“The enemy of great is good because good is “good enough.”

- Jim Collins, *Good to Great*

# Contributing Thought Leaders

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## Organizations

Campus FM Technology Association

## IWMS Solution Providers

FM:Systems

Plannon

RSC (Archibus partner)

## BIM Consultants

CAD Microsystems

Messer Construction

## Universities

The Ohio State University

University of Kentucky

University of Colorado Boulder

University of Massachusetts Lowell

Weber State University

Western Michigan University





Fort Worth, TX | January 2019

# Technologies and Strategies to Achieve Facility Information Management (FIM) Excellence

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FIS Manager

Facilities Information Services

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859-257-3703



**P R E S I D E N T**

Since 2015