# Visio Automation for Infrastructure Design and Management

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Square Mile Systems / AssetGen

# A Few Questions

- Anyone here attended previous Visio workshops?
- Which is easier and faster to complete?
  a. Updating a Visio drawing with changes
  b. Re-drawing into Visio a drawing sent in Cad/PDF/JPEG/BMP
- What has to happen to have 6500 racks drawn with consistent format and detail by different engineers?

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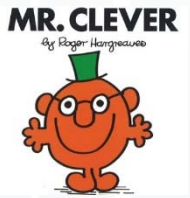
# This Workshop Will Show

- What can be <u>reduced</u> with Visio



workload - skills dependent

cost - $26 or $20,000

time - 16 minutes or 25 days

- How to improve diagram quality and accuracy
- All of which you can do later today - yourself!!

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# Visio Automation Agenda

1. Understand Visio – out of the box
2. Diagramming techniques
   - Making it simpler for all
3. Linking Visio to data sources
   - Reduce cut/paste, diagram refresh, consistency
4. Automation for larger infrastructures
   - Automated creation and updating

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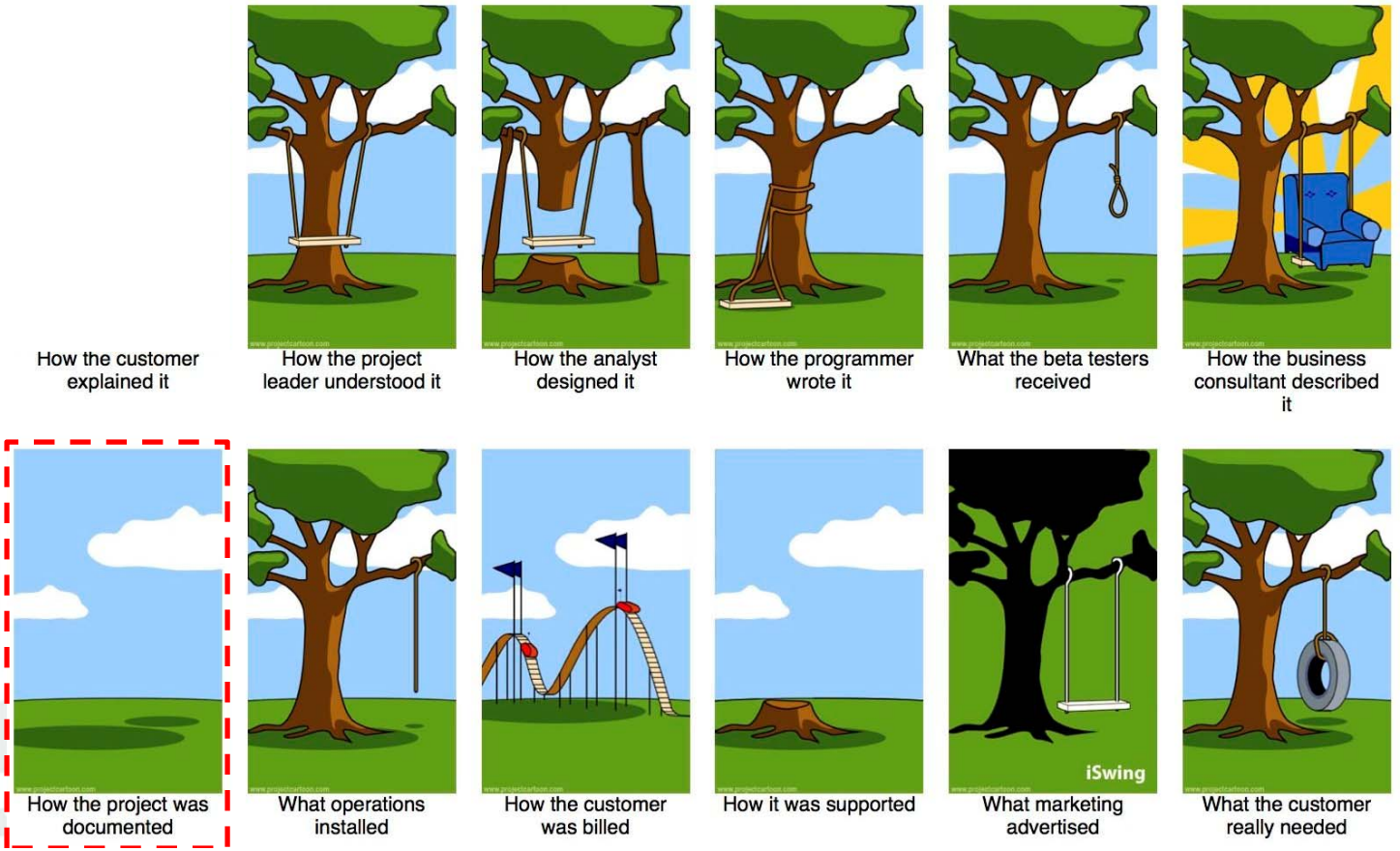
# Diagrams Are Very Useful!

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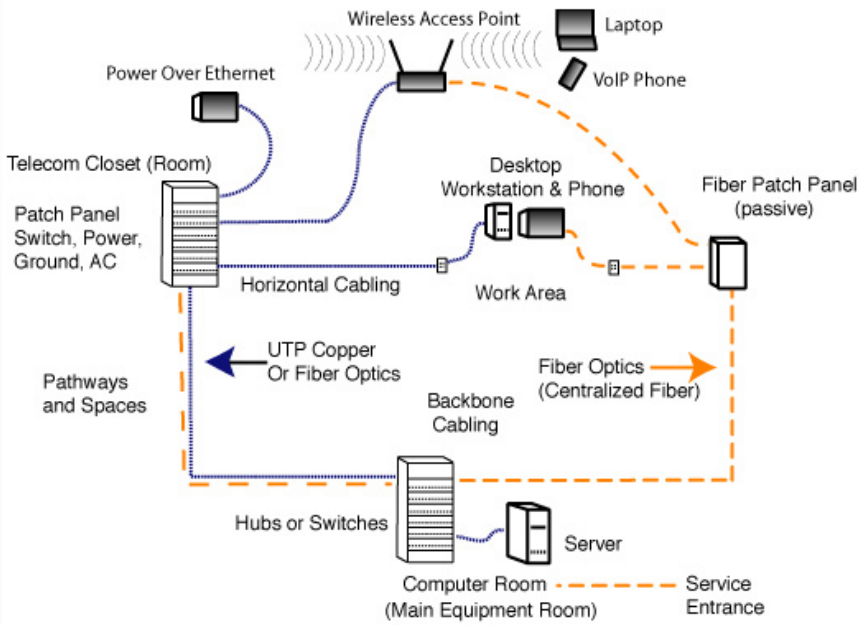
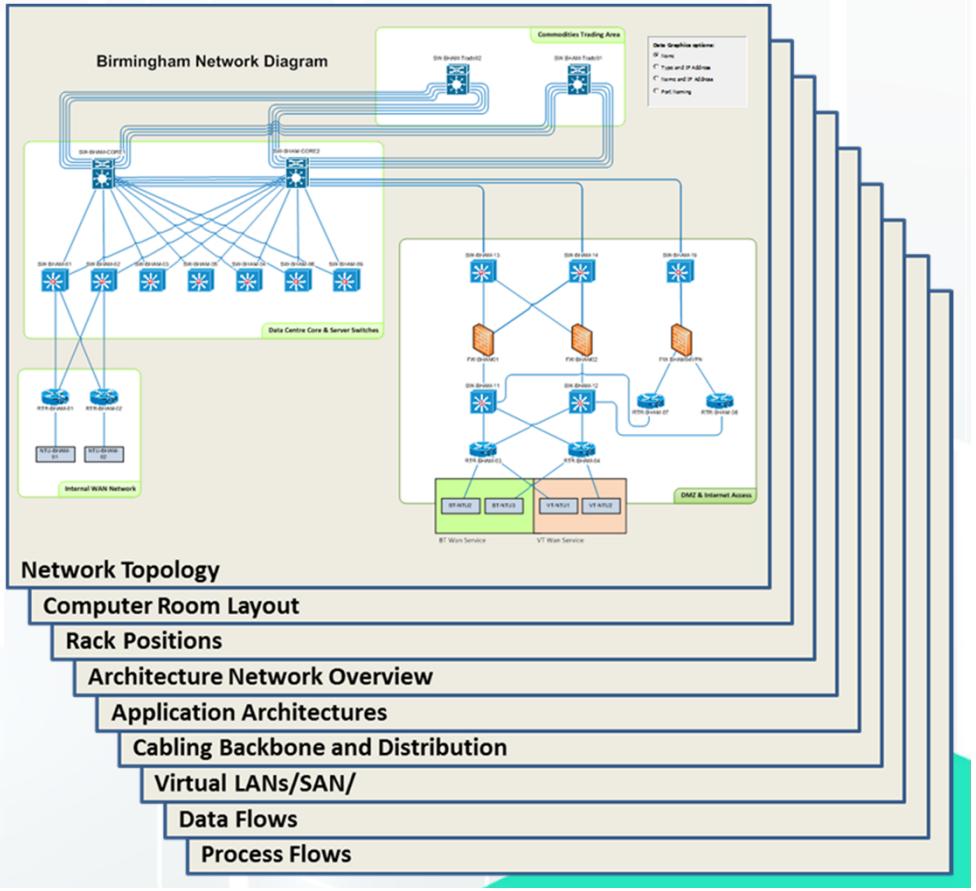
# If A Picture Paints a Thousand Words




**How do we paint a thousand pictures? Easily?**

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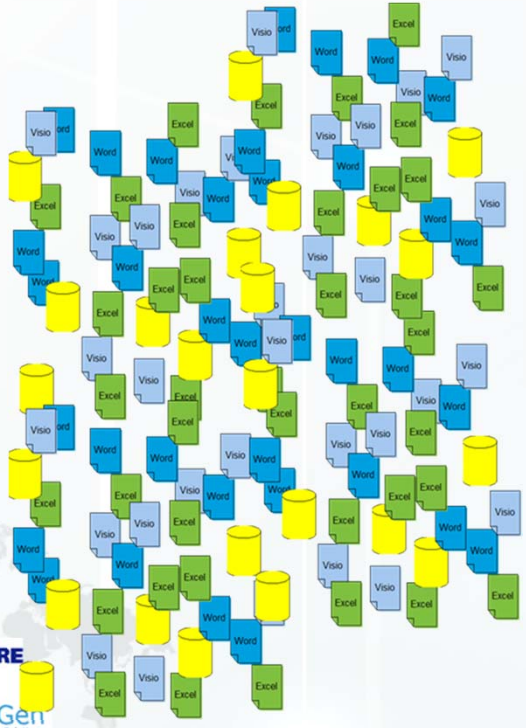
# Understanding IT Dependencies Isn't Easy

Many 1,000s of documents are created by projects, operations and risk processes

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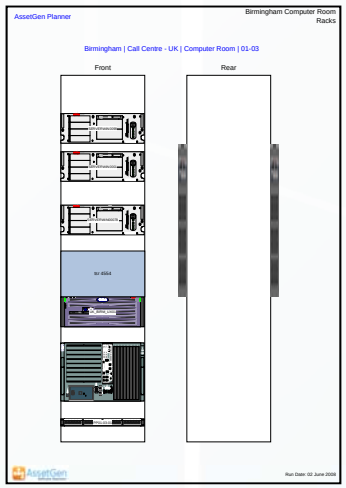
| Commercial | Physical | Logical | Business |
|---|---|---|---|
| Ownership | Room | LAN | System |
| Support | Rack | SAN | Service |
| Software | Cabling | Virtual Machines | Applications |
| Security | Power | OS | User Data |
| Contracts | Hardware Build | Remote Mgmt | DR Plan |
| Licences | Backup | Environment | Change Impact |

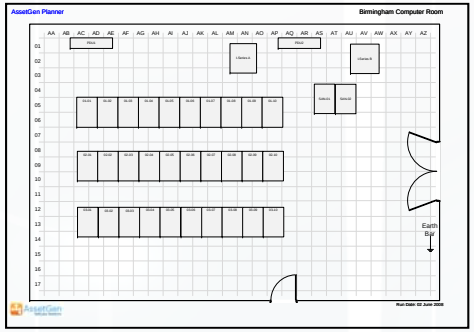
**One Server ,**
**Multiple Mappings and Diagrams**

# Dependencies & Diagrams

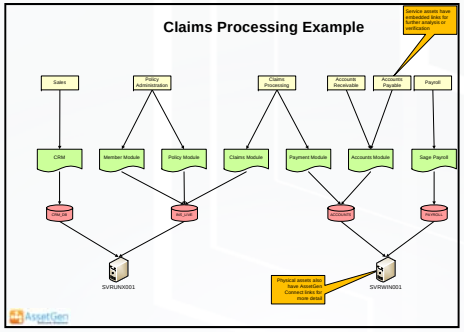
## Rack



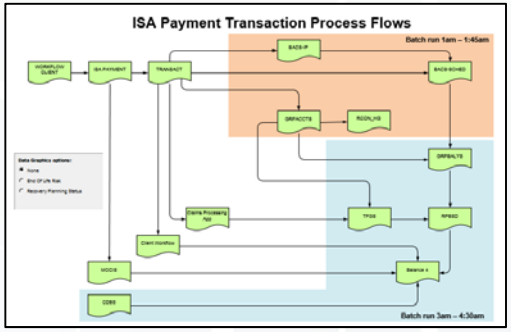

## Floor Plan



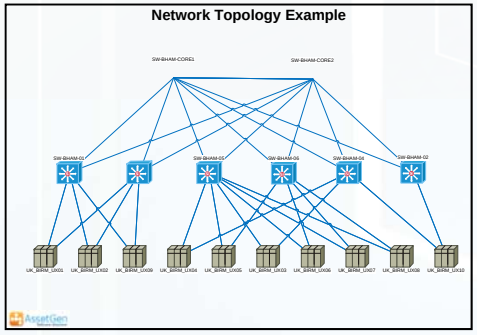

## ITIL Service Map



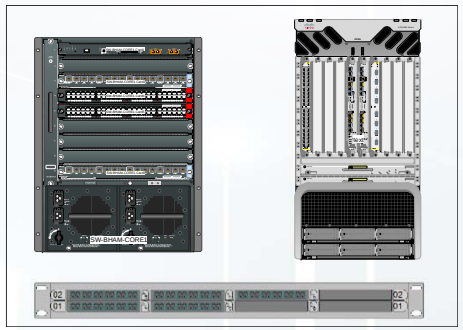

## Data Flows



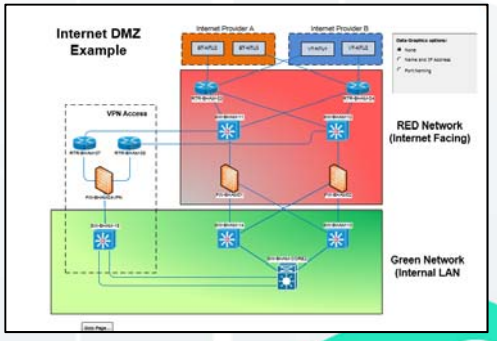

## Network Topology



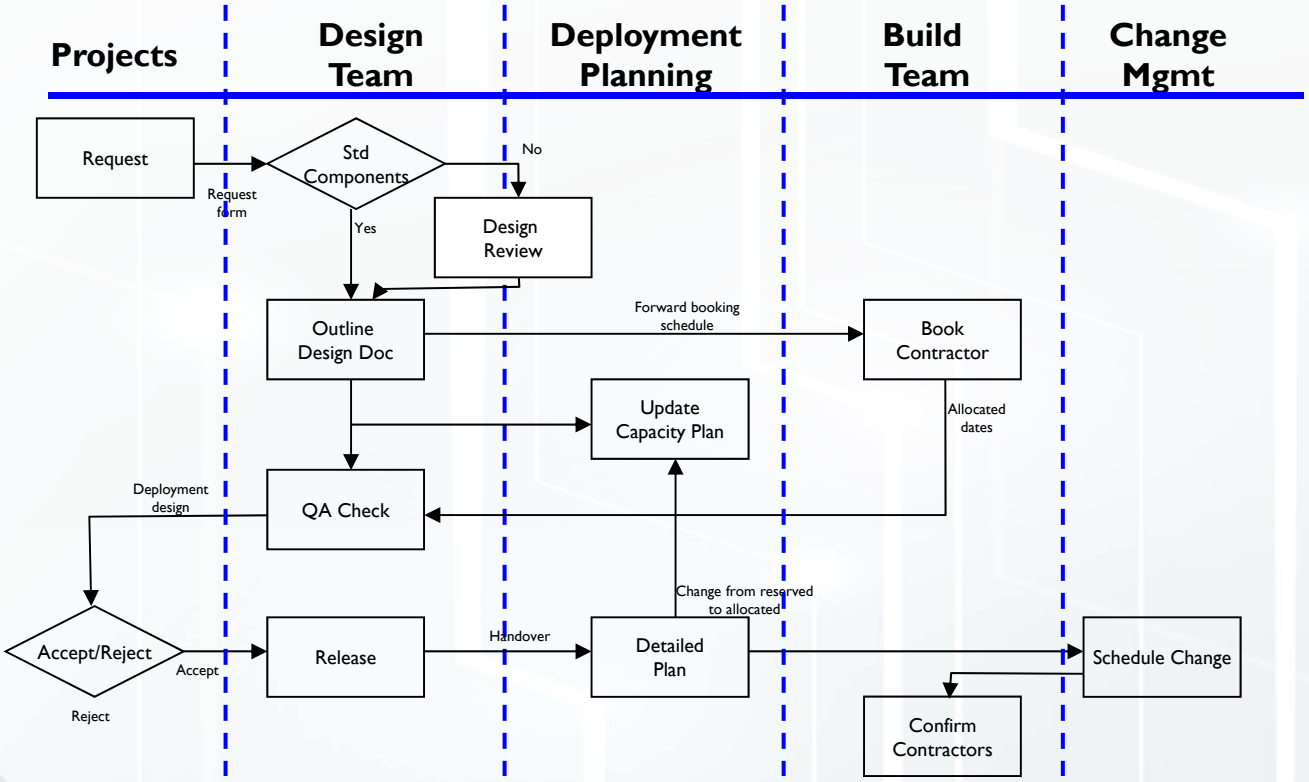

## Build




## Zones

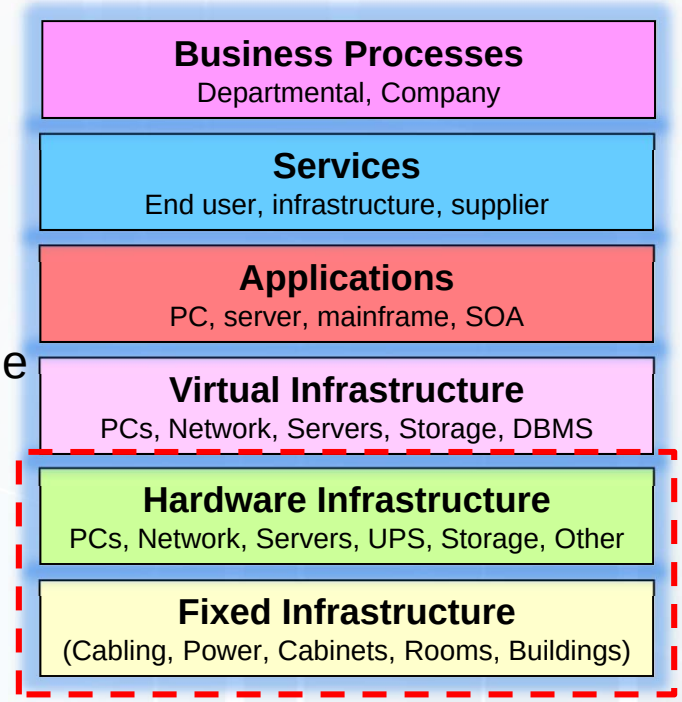


# Diagrams Also Cover Processes



# Information Gaps Cause Pain

1. Buy things you don't need
2. Don't buy things you do need
3. Reverse engineer with every project
4. Fault resolution takes longer
5. Problems escalate with distractions
6. Unnecessary site surveys
7. Project timescales are not predictable
8. Repeated "one off" audits
9. Overload key individuals
10. Less confidence in security controls
11. Inability to optimise team processes
12. Unplanned change disruption
13. Duplicate what can't be found



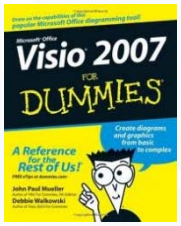
# 1. Visio Basics

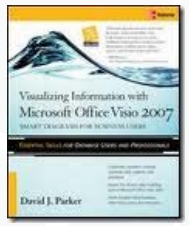
- Visio history
  - 1992 First released, 2000 acquired by Microsoft
  - Last non-MS versions had auto-discovery, equipment templates – all removed with Visio 2003
- Versions
  - Visio 2016 Standard
  - Visio 2016 Professional
  - Visio Pro For Office 365
  - Visio Viewer (runs in IE browser)
  - Visio app for iOS
  - Visio online – web based collaboration

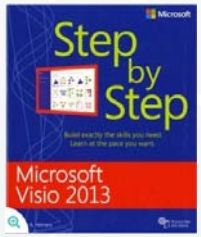
# Which Version - Standard or Professional?

- No thought required – Go for Professional!
- Why?
  - More extensive selection of shapes
  - Data linking (look for data tab)
  - Data graphics – saves typing and redrawing diagrams
  - Visio extras
- An hour saved in a year makes it worth it!

# Visio Resources And Help



- Microsoft web site
- Books
- LinkedIn group – Visio Enthusiasts
- Equipment manufacturer web sites
  - Cisco, Commscope, Siemon
  - HP, Dell, IBM, others [www.visiocafe.com](http://www.visiocafe.com) [www.shapesource.com](http://www.shapesource.com)
- 3rd Party stencils
  - netZoom, others [www.altimatech.com](http://www.altimatech.com)
- Visioguy forum [www.visguy.com](http://www.visguy.com)

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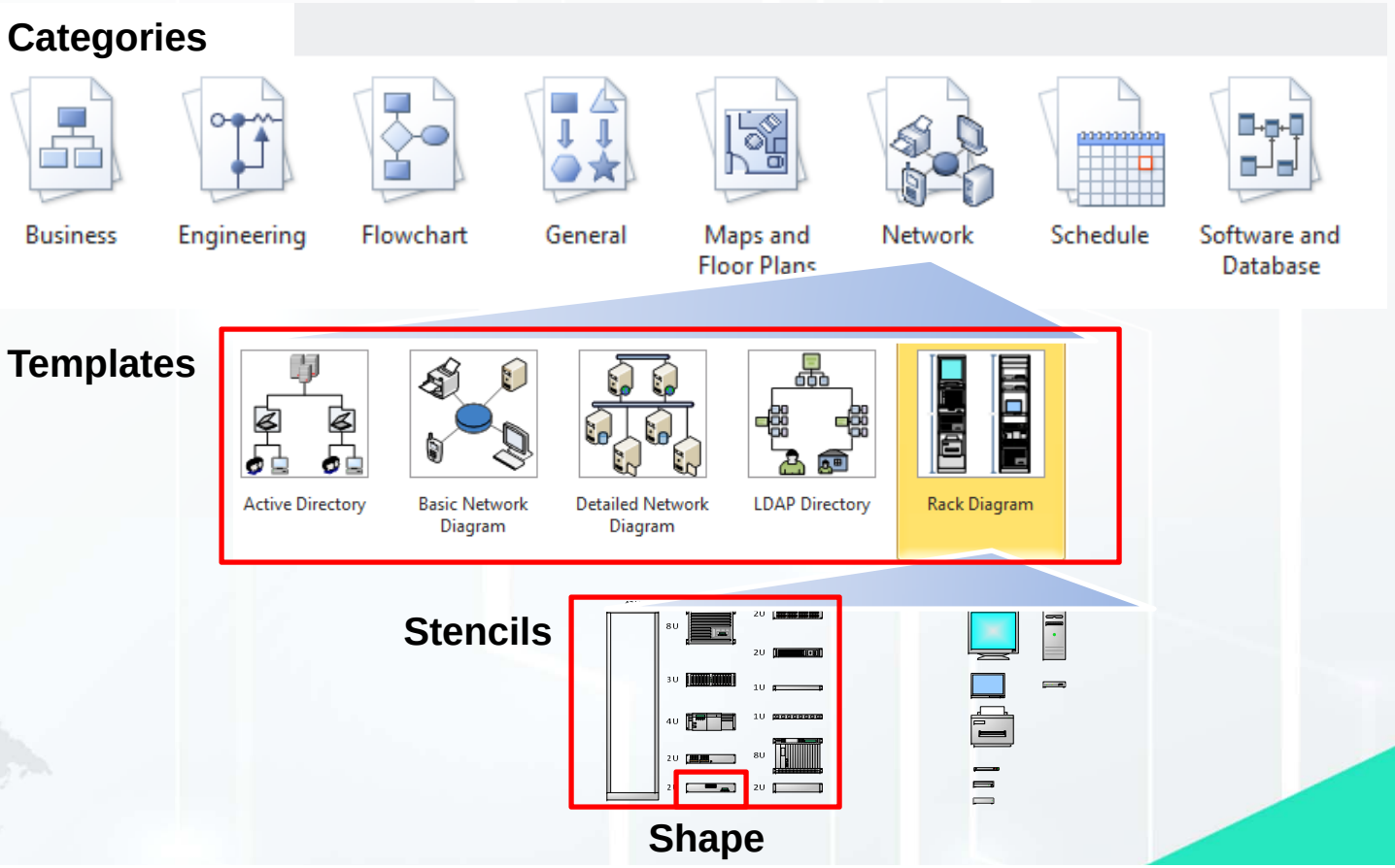
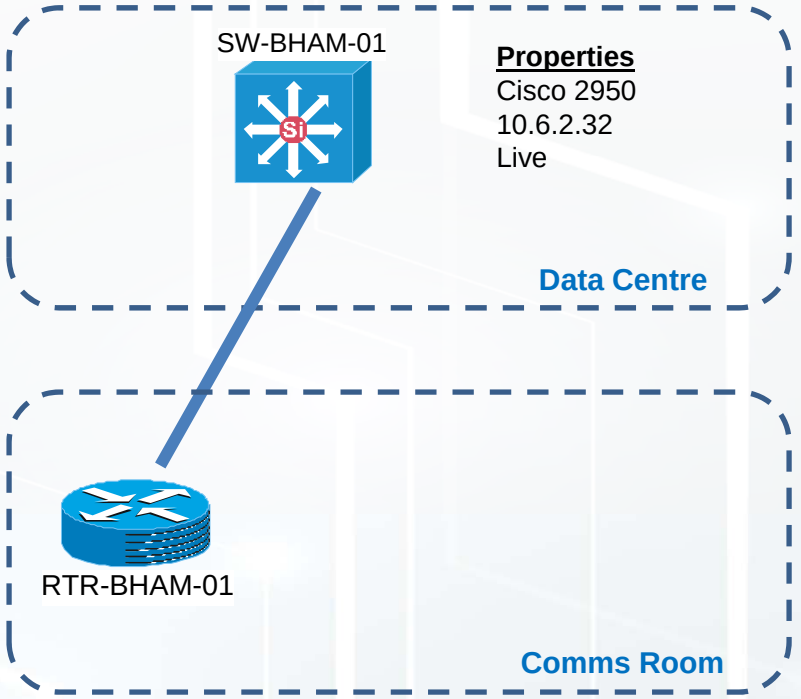
# Templates, Stencils, Shapes



# Visio Concepts and terms

- Template
- Stencil
- Shape
- Shape properties
- Connector
- Background
- Layer



# Visio Basics -1

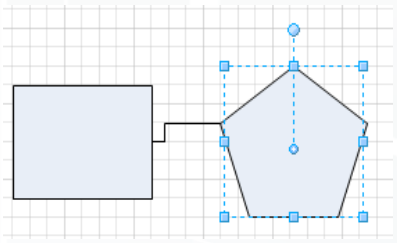
- Creating new diagram from a template
- Manipulating shapes on a page
- Aligning and Distributing Shapes
- Copy, Paste and Duplicate Shapes
- Grouping and ungrouping shapes
- Foreground and Background options
- Zooming in and Out of the Page
- Using the Drawing Toolbar to create basic shapes

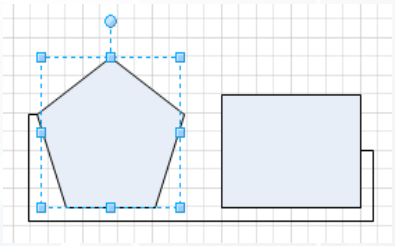
# Visio Basics - 2

- Connectors
- Static and dynamic glue
- Adding, deleting and moving connector points
- Using different stencils
  - Stencil search
- Shape behaviour -1d, 2d, drill down
- Working with text
  - Object text
  - Freeform text
  - Text block tool

# Static glue

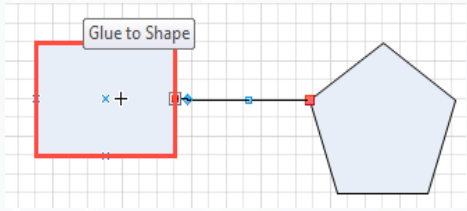
- Static glue is to a particular connection point
- The connection points used don’t move even if the shapes are moved

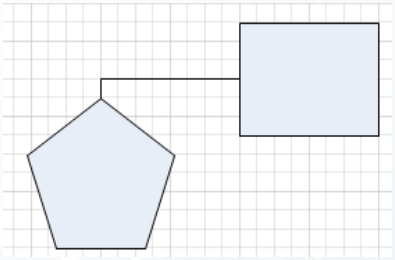




# Dynamic glue

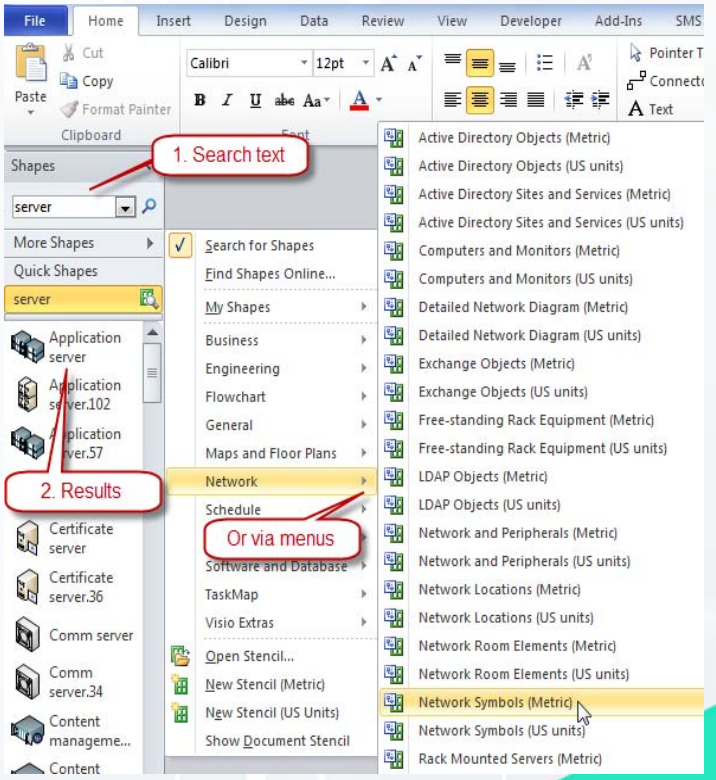
- Drag connector onto shape and wait until shape is highlighted in red
- If you move the shapes relative to each other the connection moves appropriately



# Using Different Stencils (and searching)

- Use Shapes tab
- Select via menus
- Use Search options
- External stencil sets
  - Suppliers, 3rd party



# Danger! - Visio File Sizes

Two files

| | |
|---|---|
| Diagram 1 | 1995kB |
| Diagram 2 | 12kB |

Diagram 1 is 166 times the size of Diagram 2!

Some tips to reduce file sizes

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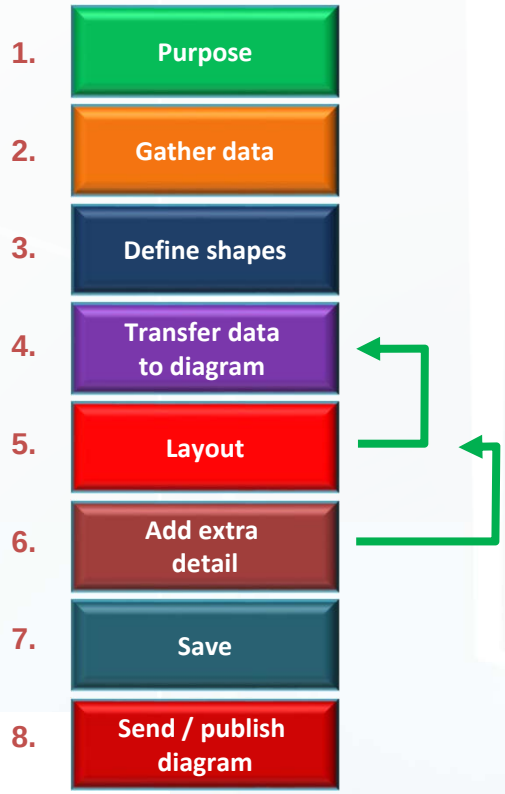
# 2. Diagramming Techniques

Good diagramming practice

1. The detail that you see
   - What is seen visually / printed
2. Additional data / information within diagram
   - Additional action by viewer – display, click, show layer, etc.
3. How you get to other information
   - Drill down, open files, launch remote session

# The Process of Creating a Diagram

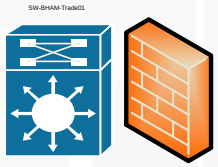



**1. Which takes the most time?**

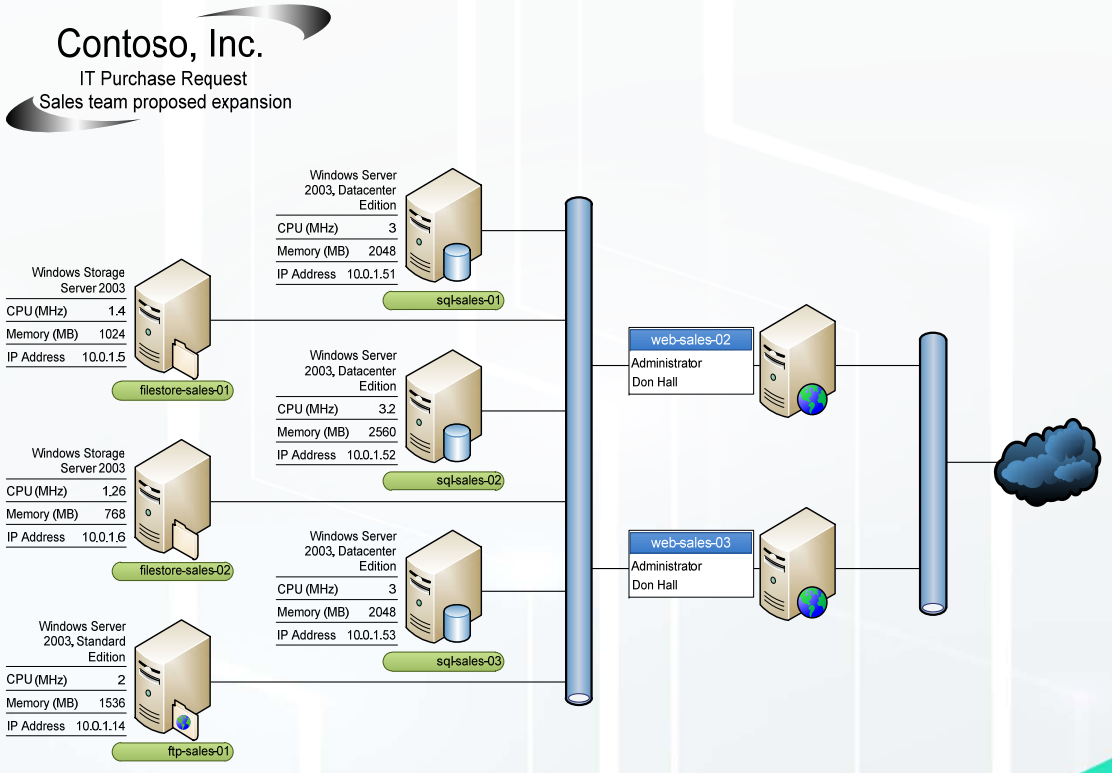
**2. Where can errors creep in?**

# Diagram Process Examples

| | | | |
|---|---|---|---|
| 1. | Purpose | Rack Diagram R01 | Network Diagram Orlando LAN |
| 2. | Gather data | Select Rack R01 Inventory | Switches / Router in Orlando |
| 3. | Define shapes | Match to Physical Shapes | Match to Logical Shapes |
| 4. | Transfer data to diagram | Create Shapes | Create Shapes and connections |
| 5. | Layout | Place/size to position in rack | Move/size for readability |
| 6. | Add extra detail | Notes, etc. | Notes, etc. |
| 7. | Save | Save as Rack R01 | Save as Orlando LAN |
| 8. | Send / publish diagram | Store on server Intranet/SharePoint | Store on server Intranet/SharePoint |

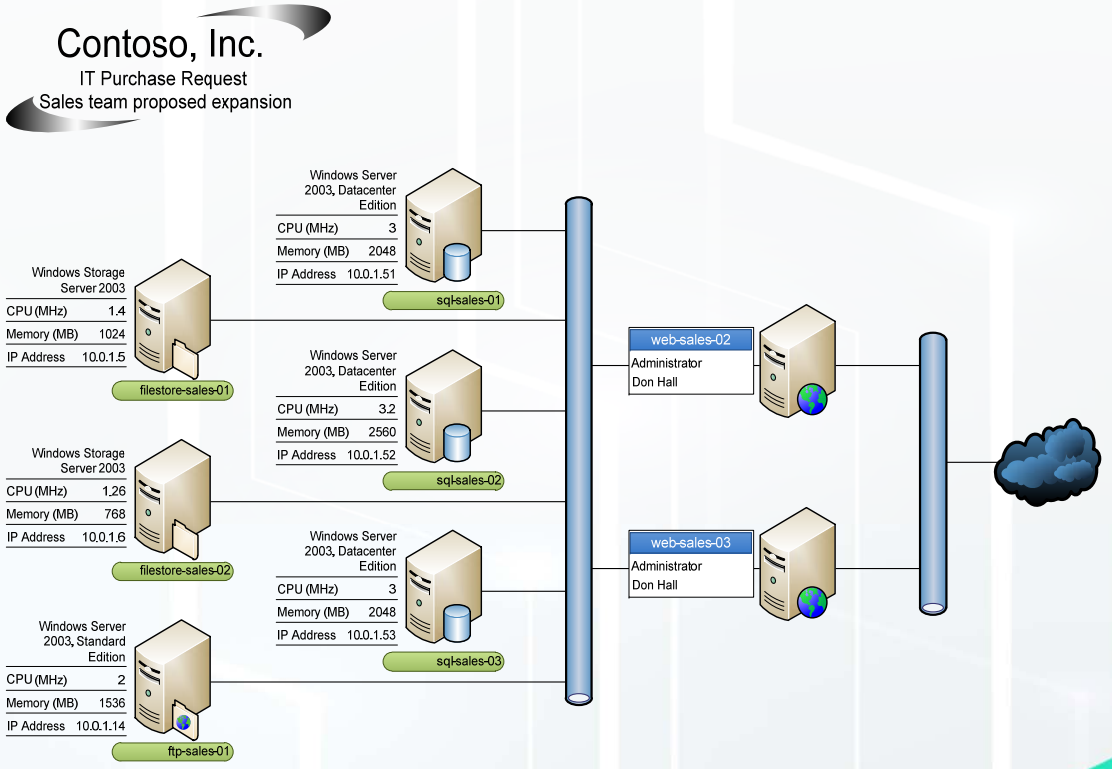


# Is This A Good Diagram?



# Does It Have These Characteristics?

1. Title
2. Purpose
3. Author
4. Version
5. Date
6. Instructions
7. Symbols
8. Attributes
9. Connections
10. Grouping
11. Background / layers



# Visio Examples

- Floor plans
- Importing CAD / other formats
- Layers
- Data center floor plans
- Backgrounds
- Hyperlinking

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# 3. Linking Visio To Data Sources

- Saves typing mistakes
- Enables refresh of data
- One diagram can serve multiple purposes
  - Less to maintain
- Multiple views of one device
  - Less to maintain
- Enables use Of Data Graphics Feature

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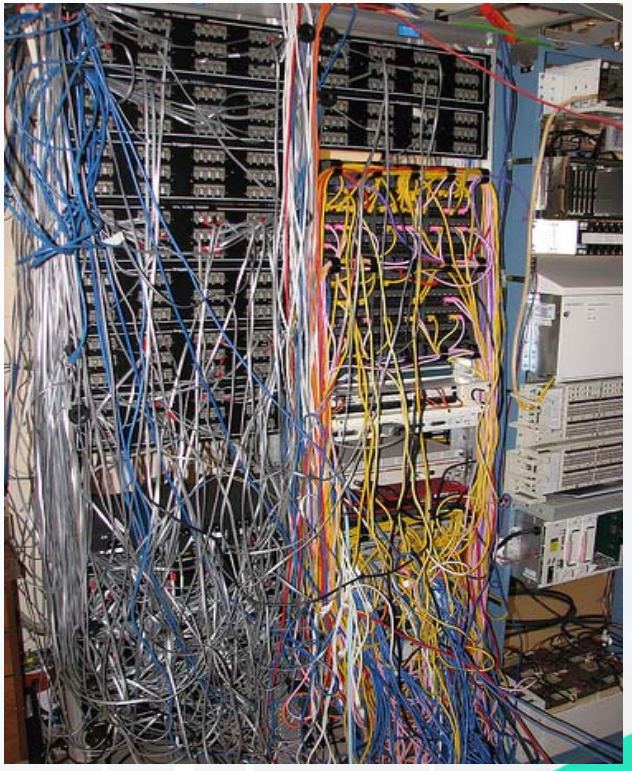
# Understanding Reality

To understand infrastructure and manage change

We need multiple views

- Rack schematics
- Equipment configuration
- Physical connectivity
- Logical end point connectivity
- End device connectivity



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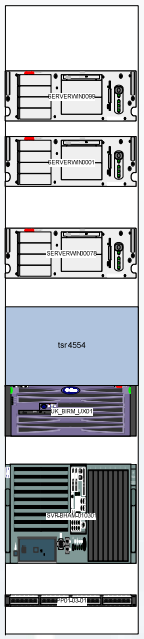
# Types Of Information / Documentation

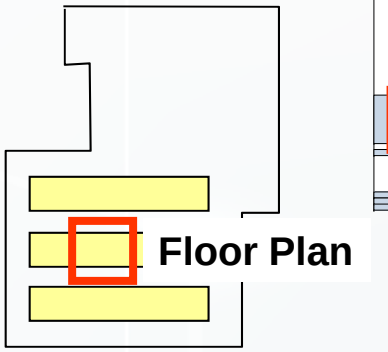
**What should be updated with a server or network change?**

1. Update project documentation with “as built” details
2. Update asset/inventory list
3. Update rack diagrams
4. Update network patching records
5. Update switch port usage and capacity
6. Update floor plan rack capacity
7. Update power usage spreadsheet(s)
8. Update storage / backup system documentation
9. Update systems architecture documentation
10. Update DR lists and documents
11. Update supplier maintenance records
12. Update billing and charging data

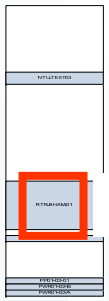


**The larger the environment – the more there is….**

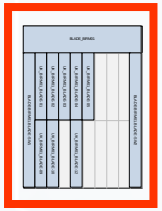
# Multiple Device Instances in Diagrams



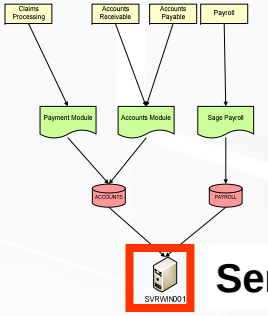
Floor Plan



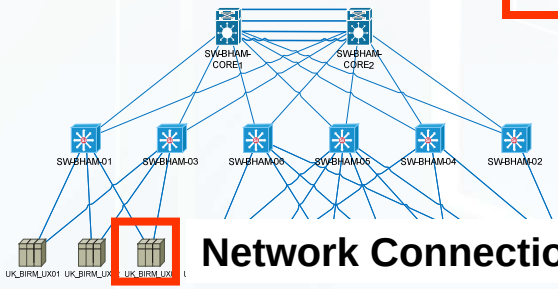
Rack Position



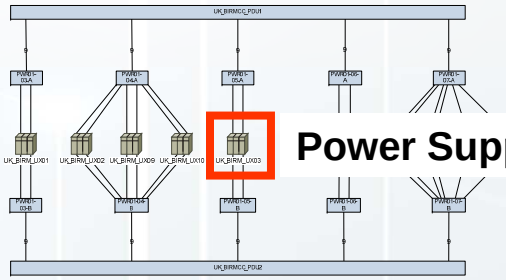
H/W Build




Service view




Network Connections




Power Supply

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# Reducing The Workload!

| | |
|---|---|
| Floor box list | Floor plan |
| Cabinet list | Equipment room floor plan |
| Patch panel list | Backbone cabling diagram |
| Inventory | Network diagram |
| Inventory | Rack diagram |
| Inventory | Server connectivity diagram |

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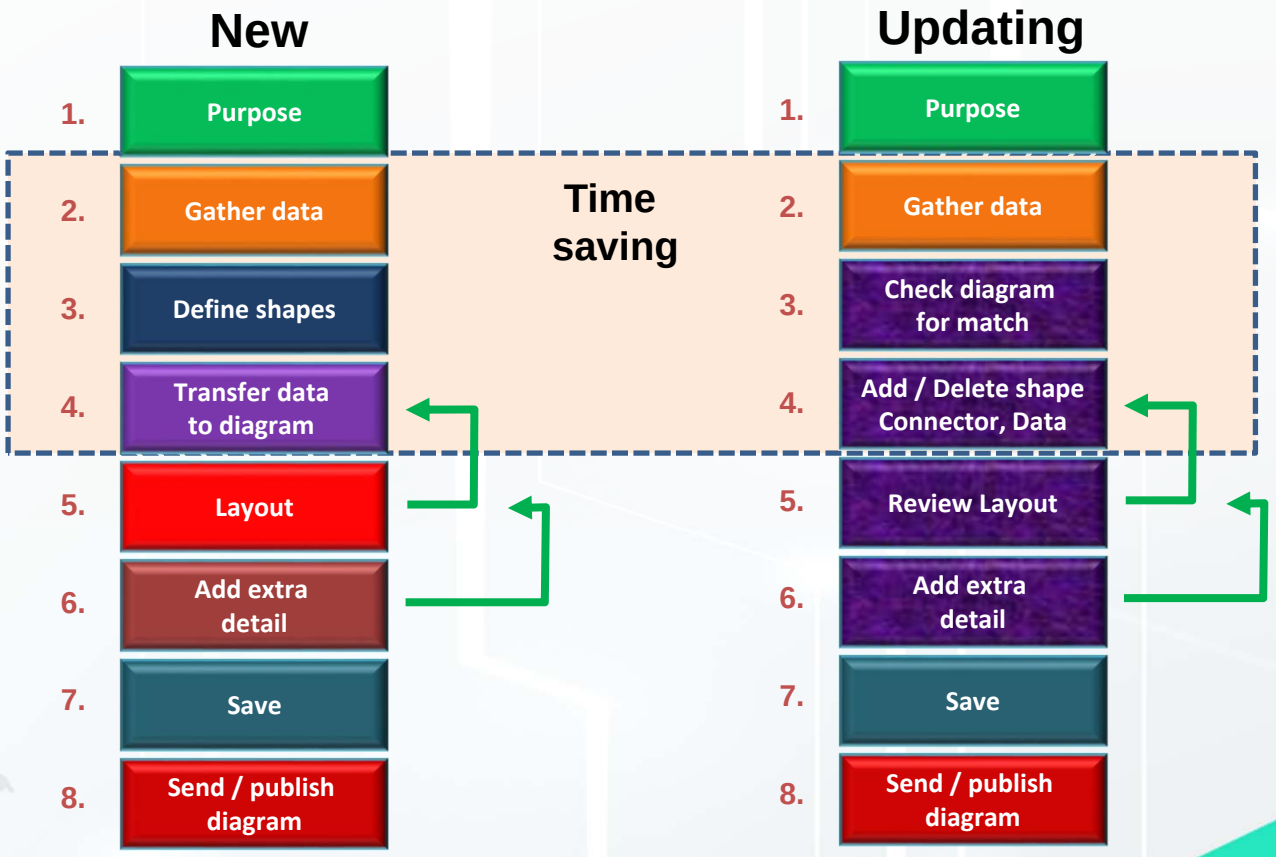
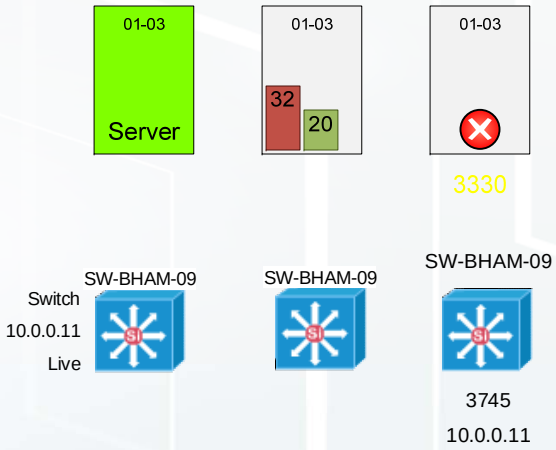
# Using External Data Sources



# Visio Data Graphics

- Standard feature 2007/10/13/16 Professional
- Enables use of embedded data
  - Display multiple text fields around a shape
  - Data bars to show capacity
  - Use icons for status differences
  - Change shape colour based on data value



# Limitations Of Visio / Data Source

- Good for quick diagrams
- The data transfer and refresh is automated, but the filtering and selection is manual
- It doesn't connect shapes together
  - Limits value in a network environment
- New devices are not added to diagrams

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# First Steps For Multiple Diagrams

- Control use of shapes / stencils
- Follow best practices for diagram information
- Save reference versions in common areas
  - File locations
  - Web site
  - SharePoint
- Use a common source where possible for shape data
  - Databases preferred to spreadsheets
  - Create views to suit diagram information need

# 4. Automation For Larger Infrastructures

- Looking beyond a few spreadsheets
- Minimise manual maintenance effort
  - Scale and separation of roles demands it
- Improving accuracy and consistency
  - Software driven diagram production
- Infrastructure document management
  - Shared across teams, controlled access



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# Automating Documentation - Example

- Manual method – draw a rack diagram 2 – 5 hours
  - Gather rack inventory data and positioning
  - Find Visio shapes for equipment
  - Draw the rack
- Automated method with software 10 seconds
  - Tick rack for cabinet drawing
  - Visio rack diagram produced
- 100 racks – 16 minutes or 25 days or $26 vs $20,000 ($100hr)
- 6500 racks???

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# Automated Enterprise Drawing

- Should we draw and redraw diagrams in Visio or have a GUI that does this onto a database?
  - Yes for simple views (ie rack, path) DCIM/CMS approach
  - No for anything that requires layout or crosses technologies
    - Physical – floor plans, blown fiber, cabling runs, OSP
    - Logical – LAN/SAN/VLAN/WAN/VLAN system
- If we are refreshing data, then we have to update existing shapes, adding/removing shapes and connectors.
  - Beyond Excel/Visio data linking

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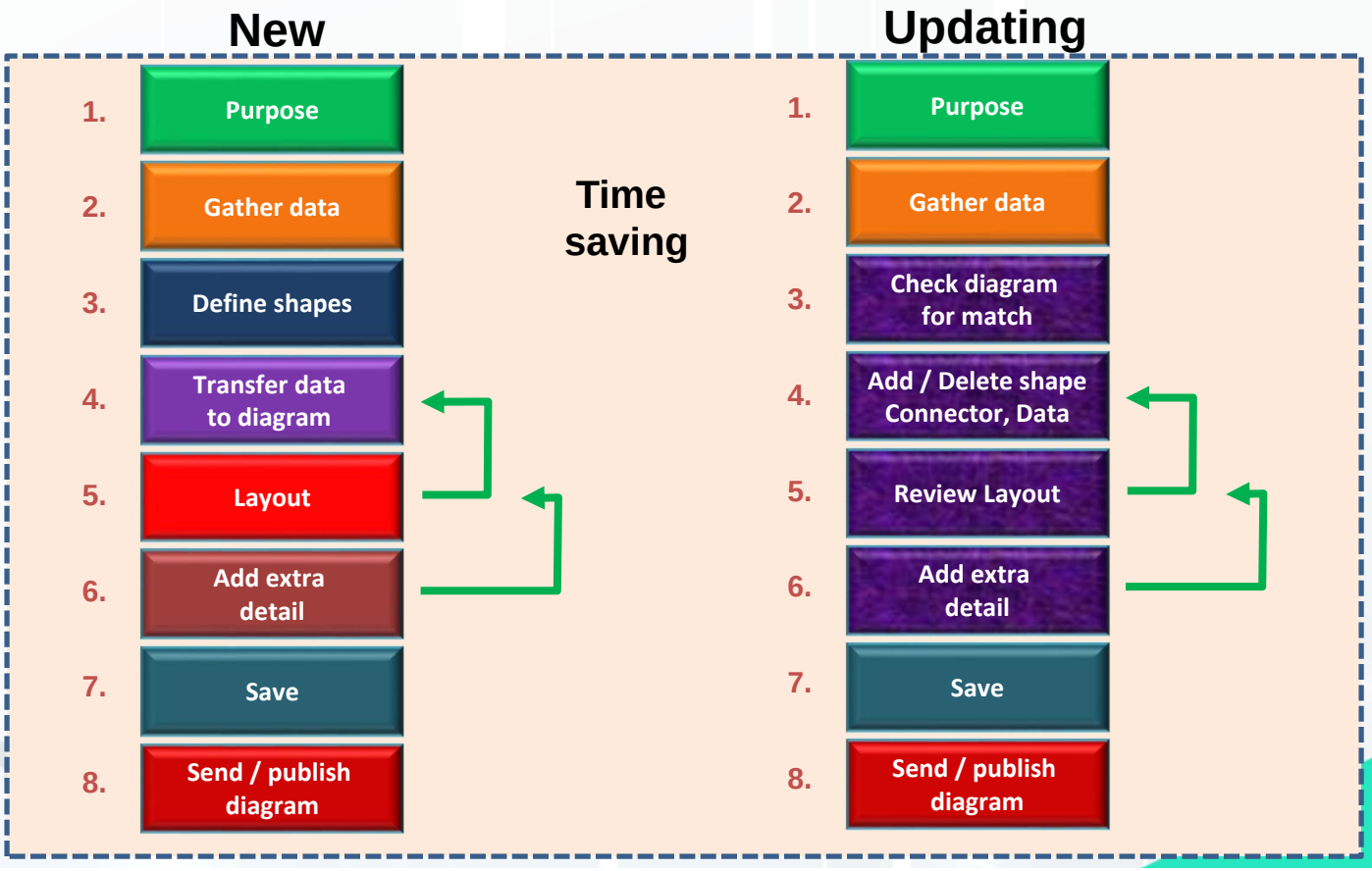
# Extending Visio Automation

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# Simple Goals

- Draw 60 rack diagrams and save on a file server, in folders listed by room location
- Check and update 100 site network diagrams with changes in devices, connections and data
- Refresh an updated set of build documents covering racks, hardware, cabling, power within a data center transition project
- When – now, tonight, every Friday

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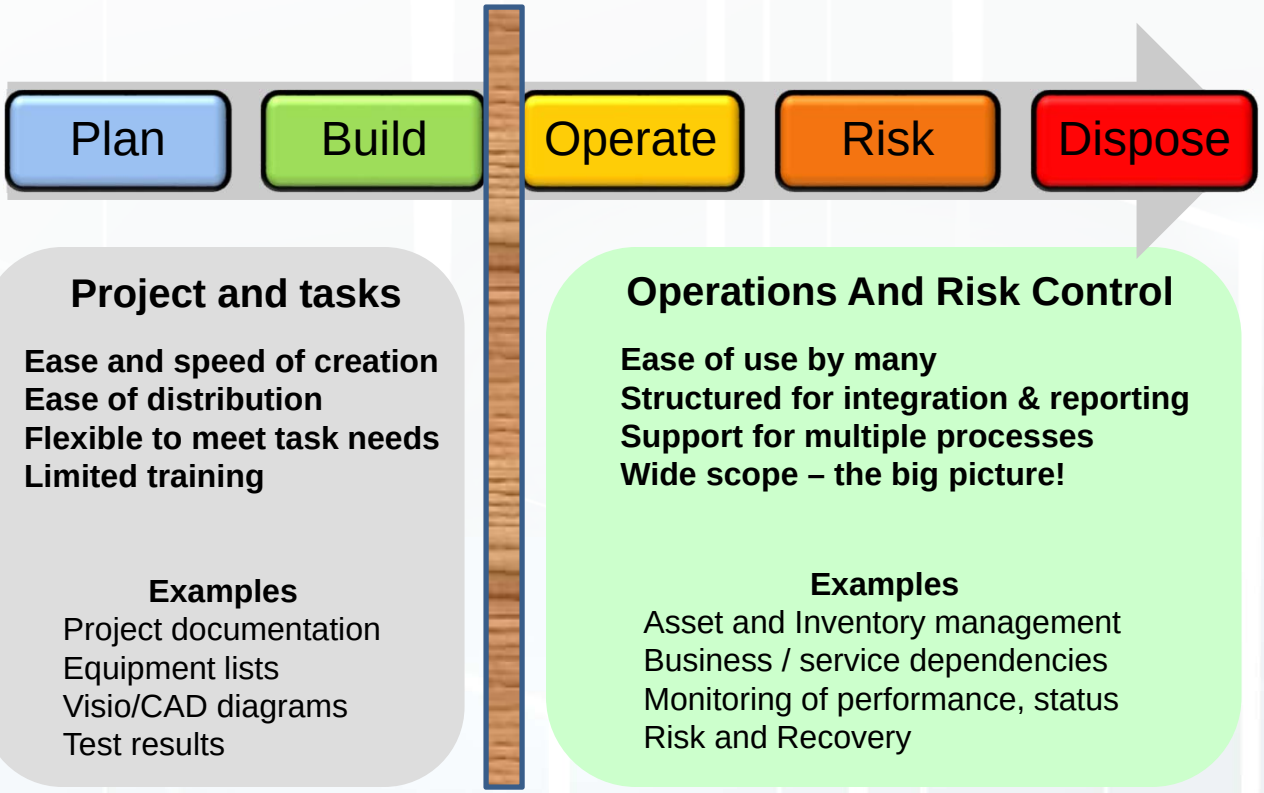
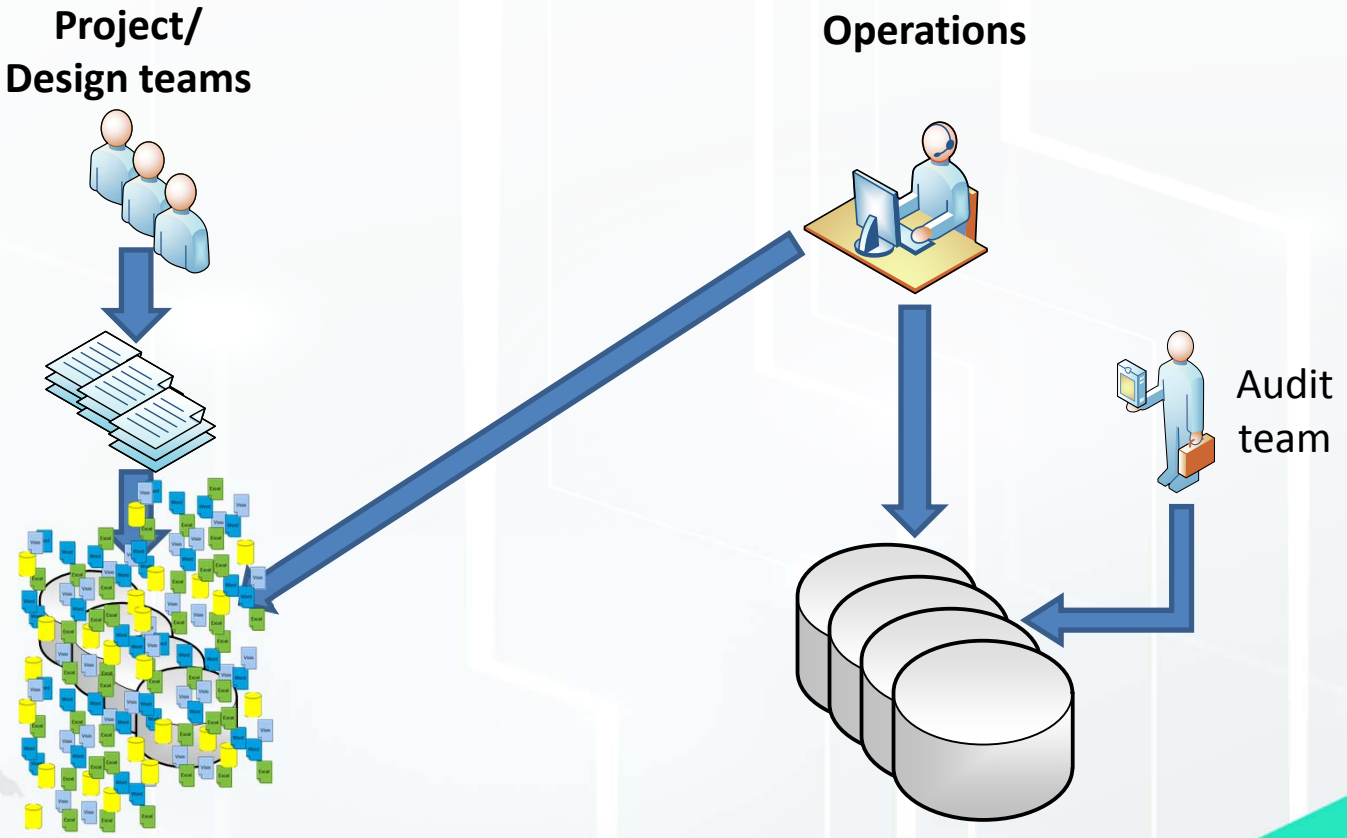
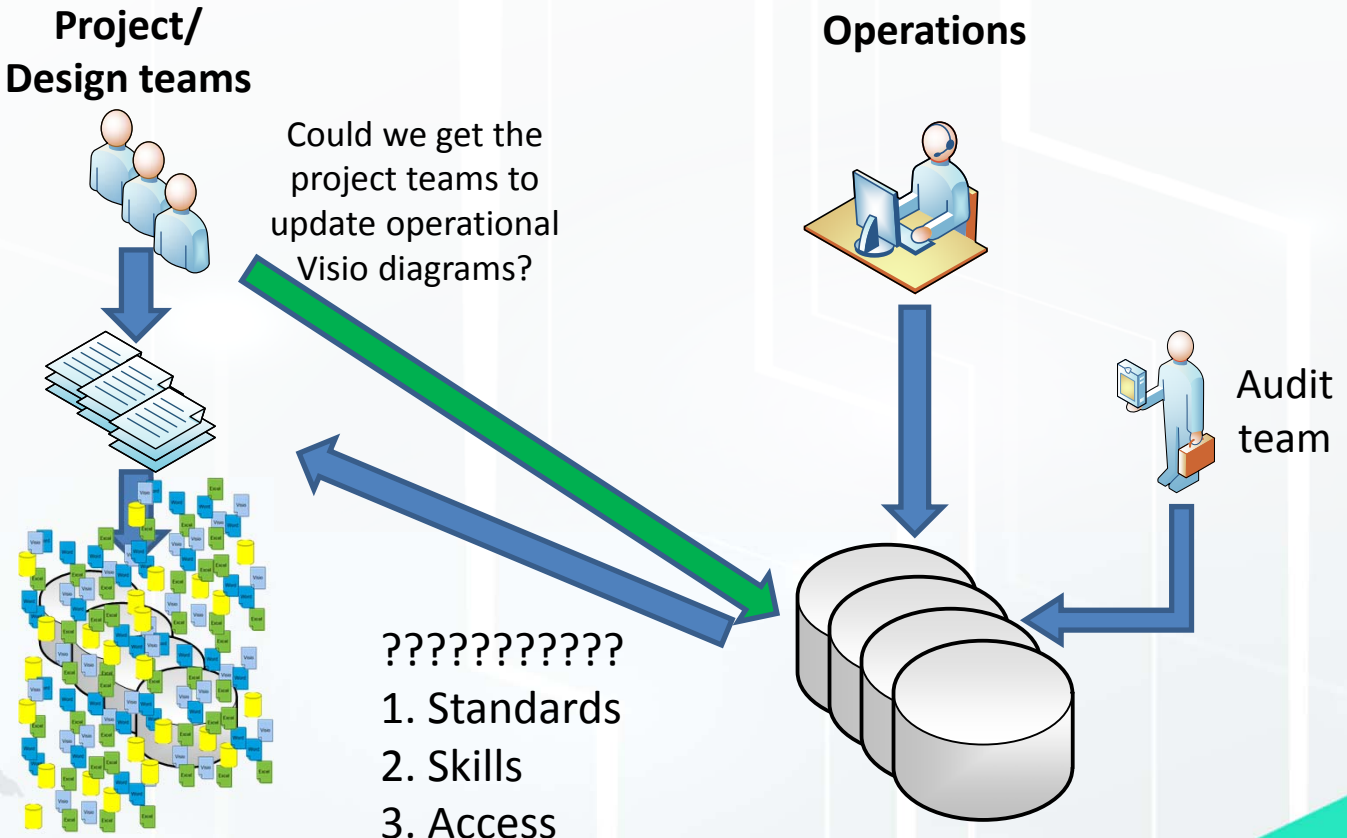
# Many Infrastructure Information Needs



# Infrastructure Documentation Workflow

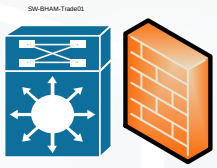


# Infrastructure Documentation Workflow



# Diagram Automation Examples

| | | | |
|---|---|---|---|
| 1. | Purpose | Rack Diagram R01 | Network Diagram Orlando LAN |
| 2. | Gather data | Select Rack R01 Inventory | Switches / Router in Orlando |
| 3. | Define shapes | Match to Physical Shapes | Match to Logical Shapes |
| 4. | Transfer data to diagram | Create Shapes | Create Shapes and connections |
| 5. | Layout | Place/size to position in rack | Move/size for readability |
| 6. | Add extra detail | Notes, etc. | Notes, etc. |
| 7. | Save | Save as Rack R01 | Save as Orlando LAN |
| 8. | Send / publish diagram | Store on server Intranet/SharePoint | Store on server Intranet/SharePoint |





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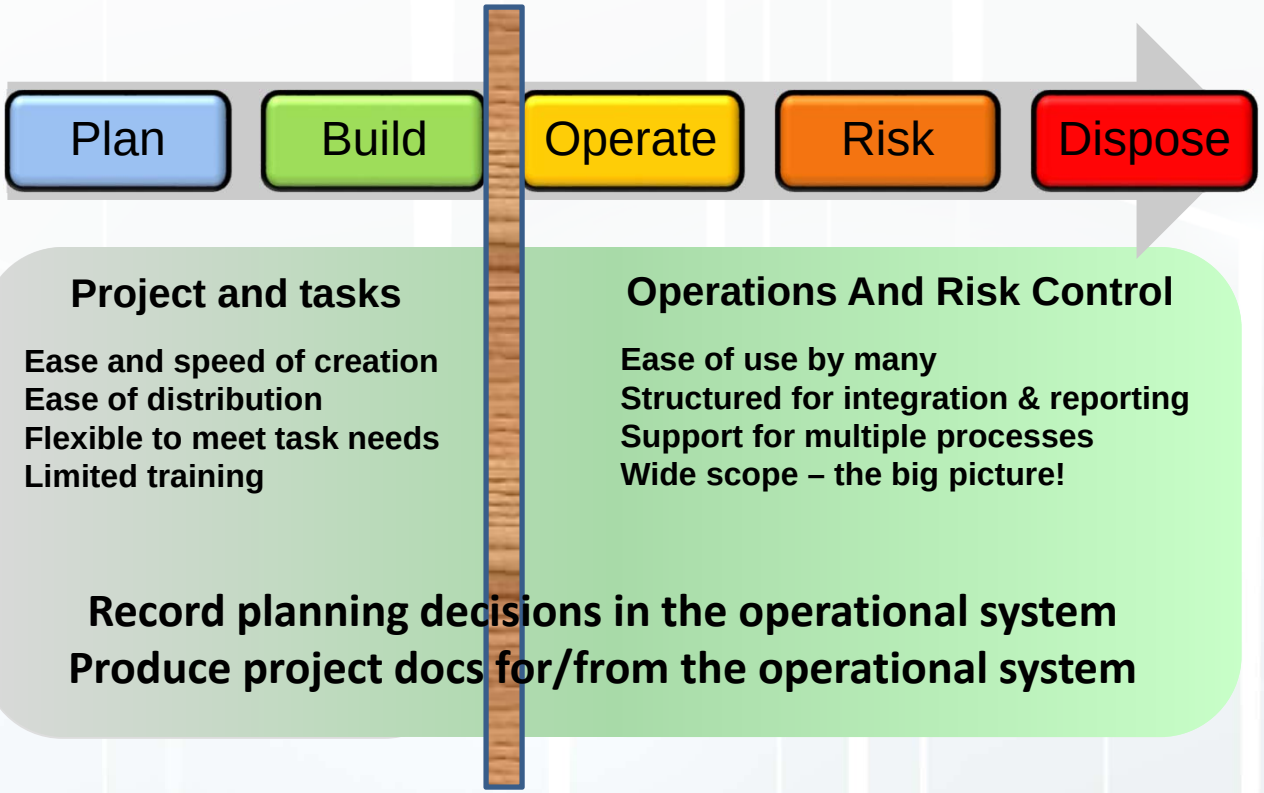
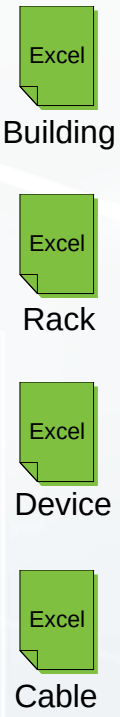
# Maintain - Infrastructure Knowledge



# Simplify Infrastructure Data Capture

- Data capture focusses on delivering database load files
- Visualization is either created automatically, or by combining data with existing backdrops - floor plans
- No need to check across multiple diagrams / documents for consistency and format

A faster, less complex and less costly audit, which doesn't require high skill levels within the audit team as software creates/updates the visualization



# Making Trusted Data A Reality

1. Establish policies, standards and ownership of data and diagrams.
   Make it simpler and easier for engineers and managers

2. Have project / operations use common terms & formats
   Supply templates, naming system, labels, etc.

3. Reduce the numbers of documents / files to maintain
   Consolidate into centralised systems and make them easy to find
   Link / create / update Visio diagrams, reports, excel from databases

4. Use operational systems to support planning processes

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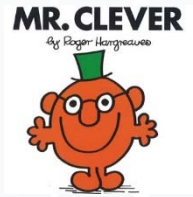
# This Workshop Has Shown




- What can be <u>reduced</u> with Visio

workload - skills dependent

cost - $26 or $20,000

time - 16 minutes or 25 days

- How to improve diagram quality and accuracy

All of which you can do later today - yourself!!

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# Visio Automation Tips and Techniques

- Lots of productivity features are unknown
  - Save yourself and others a lot of effort planning and managing infrastructure!
  - Learn more about Visio
- Linking to existing data sources has many benefits
  - Less errors, easier to refresh diagrams and update them
  - Use the data graphics feature to reduce diagram numbers
- For larger environments
  - Assess the value of database driven systems

# Additional Materials

## www.microsoft.com

## www.assetgen.com

Evaluation software

Webinars

Free “DCIM/CMS” evaluation version

Data center practices, Visio integration

## www.squaremilesystems.com

Free SMS Visio utilities

Training/webinars/videos

Downloads and videos

Onsite/remote Visio training, documentation methods, etc.