Automating Infrastructure Documentation With Microsoft Visio

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SQUARE MILE

AssetGen
Software Solutions

A Few Questions

- Anyone here attended the workshops in 2014, 2016 or 2018?

- 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?

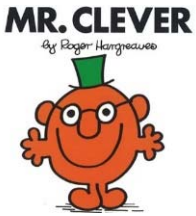
This Workshop Will Show

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

workload - skills dependent

cost - $26 or $20,000

time - 16 minutes or 25 days

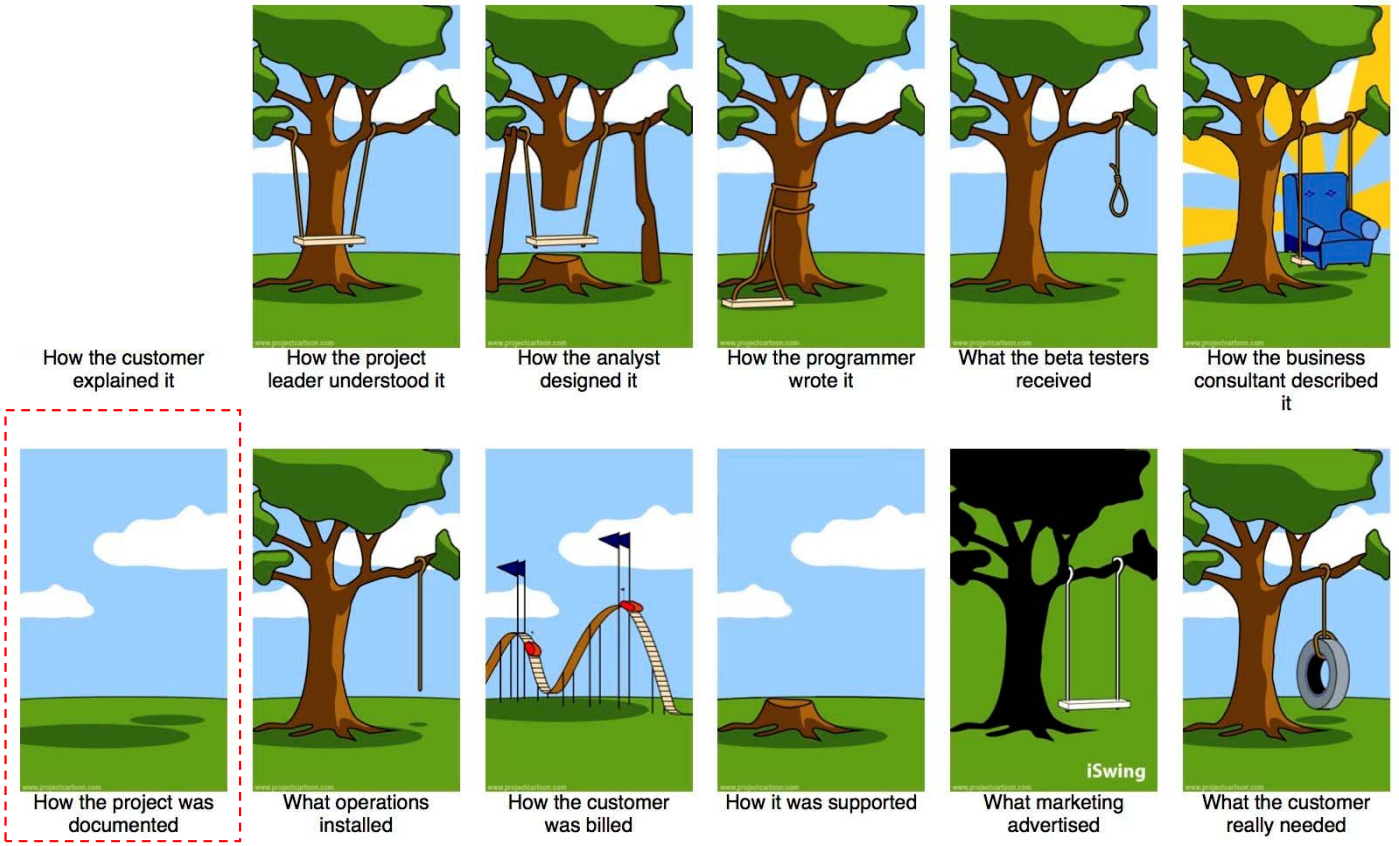


- How to improve diagram quality and accuracy
- All of which you can do later today - yourself!!

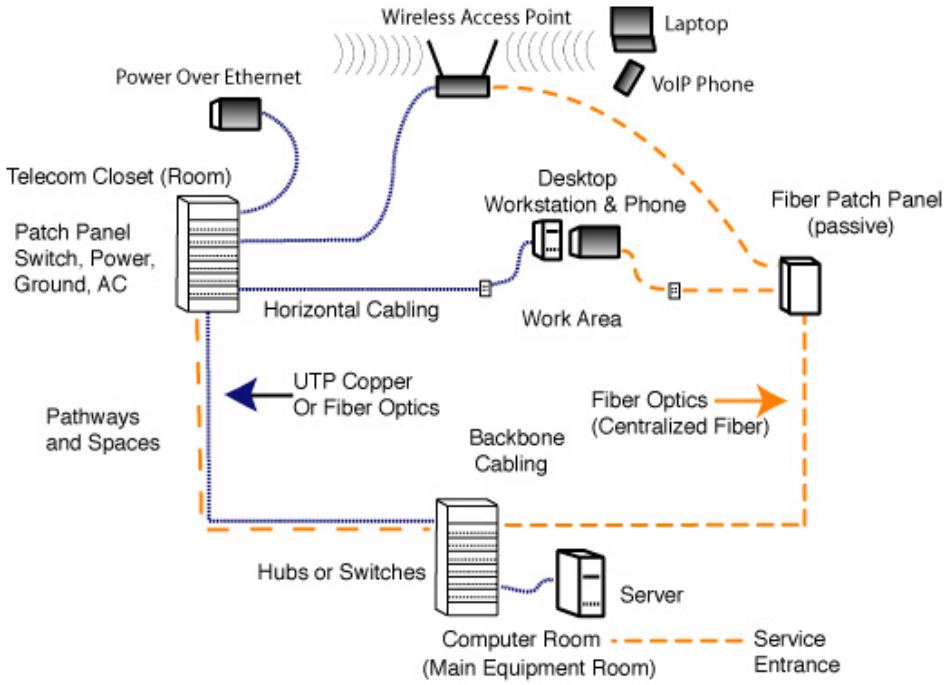
Visio Automation Agenda

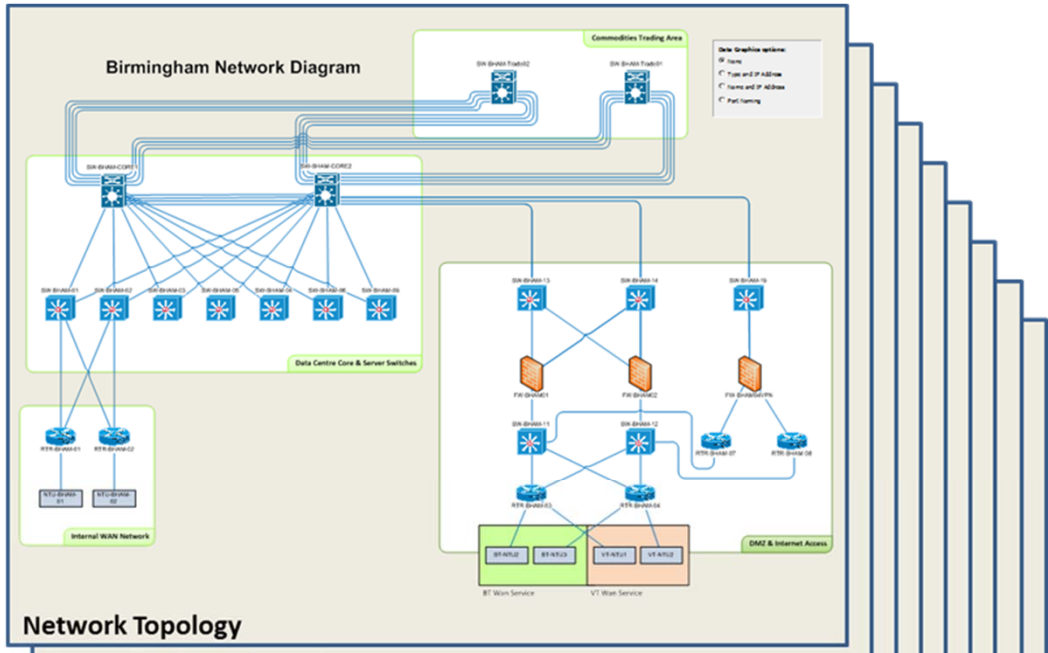
1. Understand Visio – out of the box
2. Diagramming techniques
   - Making it simpler for all
3. Linking Visio to data sources
   - Reduce cut/paste, diagram refresh, consistency
4. Automation for larger infrastructures
   - Automated creation and updating

Diagrams Are Very Useful!



If A Picture Paints a Thousand Words



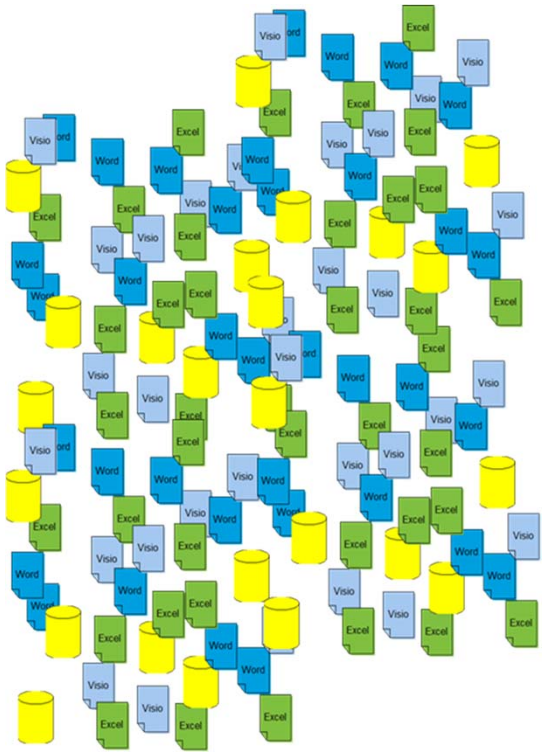


How do we paint a thousand pictures?

Consistent in data and format?

Understanding IT Dependencies Isn't Easy

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



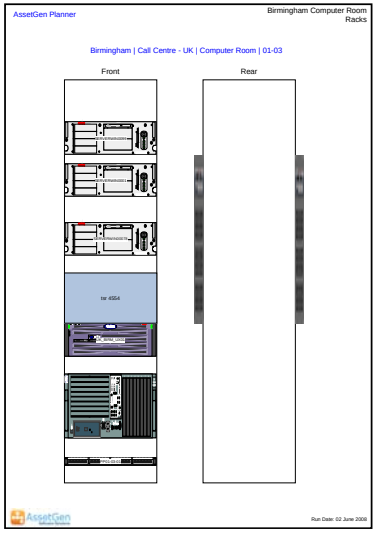
Data → Diagrams

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

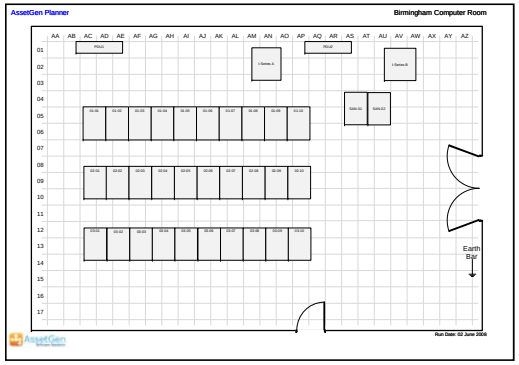
One Server ,
Multiple Mappings and Diagrams

Dependencies & Diagrams

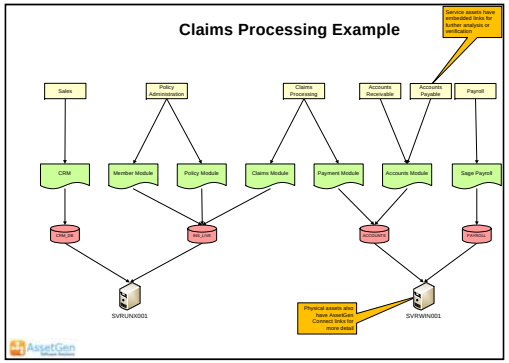
Rack



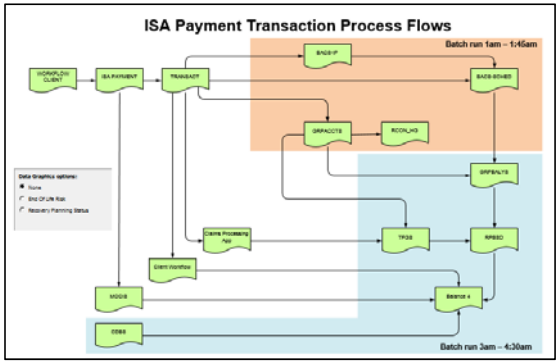
Floor Plan



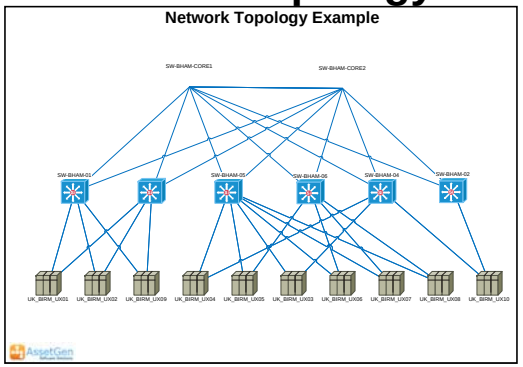
ITIL Service Map



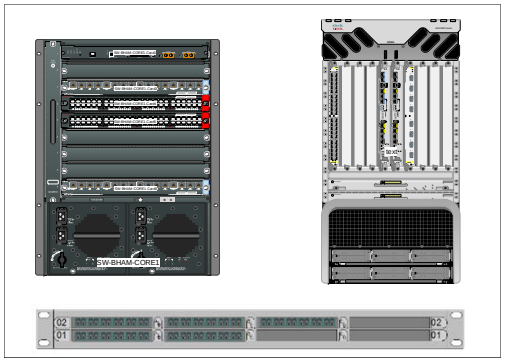
Data Flows/Capacity



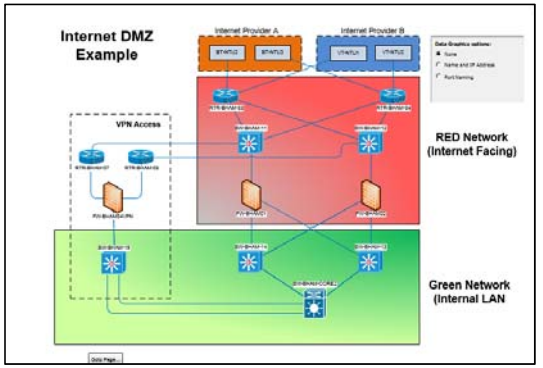
Network Topology



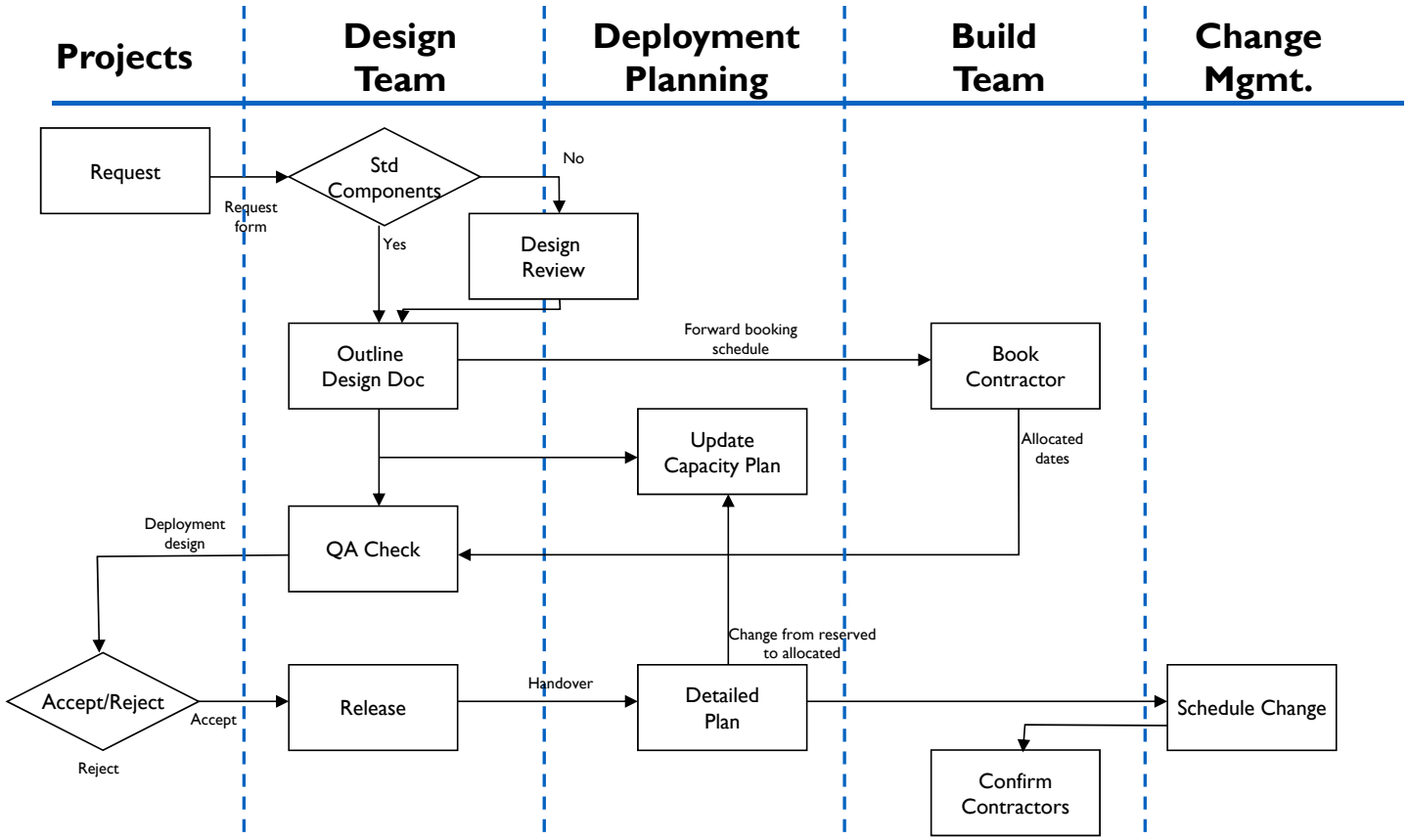
Build



Zones

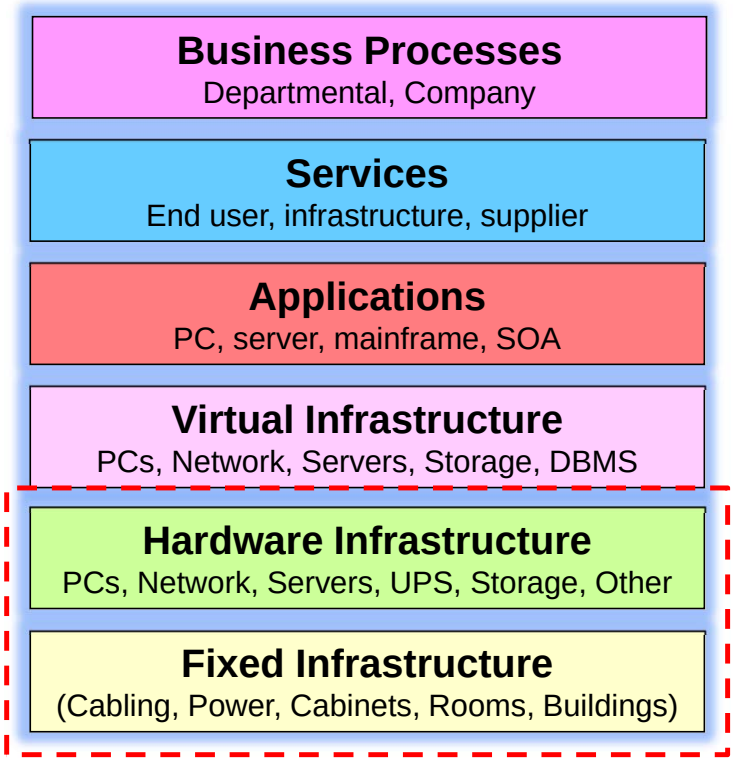


Diagrams Also Cover Processes/Timelines



Information Gaps Cause Pain – Cost, time, quality

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



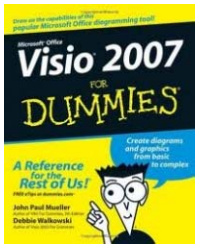
1. Visio Basics

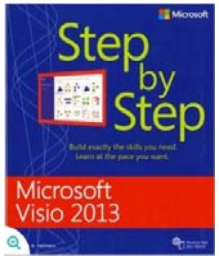
- Visio history
  - 1992 First released, 2000 acquired by Microsoft
  - Last non-MS versions had auto-discovery, equipment templates – all removed with Visio 2003
- Versions
  - Visio 2019 Standard
  - Visio 2019 Professional
  - Visio Pro For Office 365
  - Visio Viewer (runs in IE browser, outlook)
  - 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

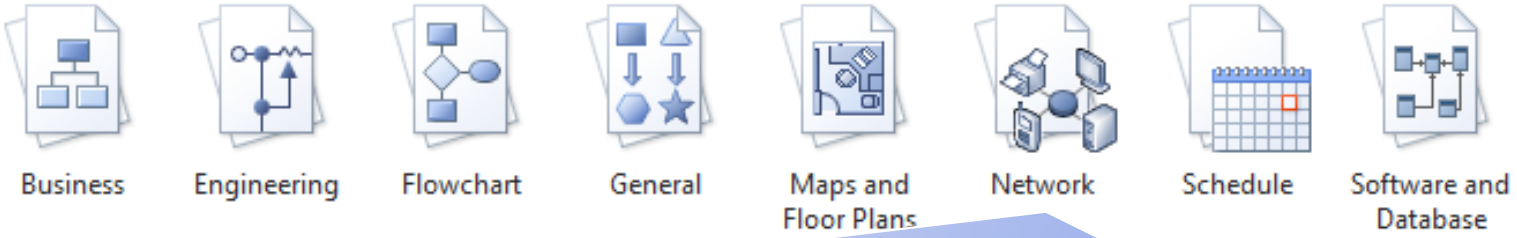




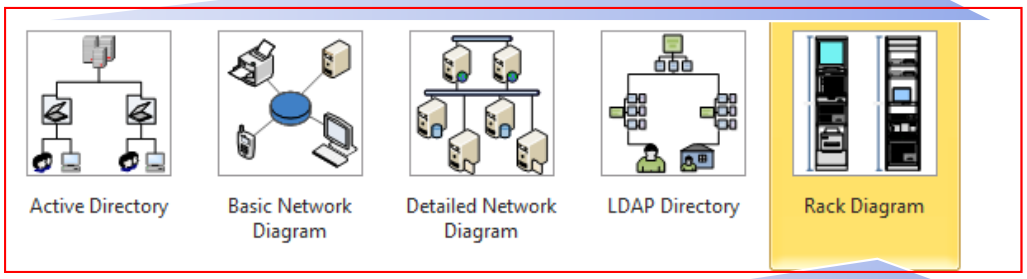
- Microsoft web site
- Books
- LinkedIn group – Visio Enthusiasts
- Equipment manufacturer web sites
  - Cisco, CommScope, Siemon
  - HP, Dell, IBM, others www.visiocafe.com www.shapesource.com
- 3rd Party stencils
  - netZoom, others www.altimatech.com
- Visioguy forum www.visguy.com

Templates, Stencils, Shapes

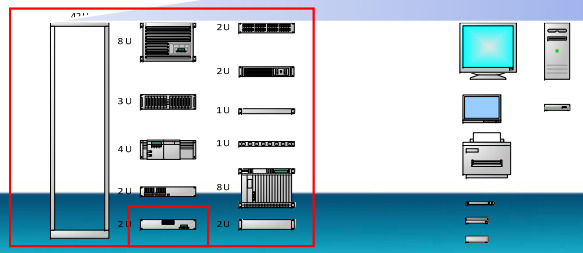
Categories



Templates



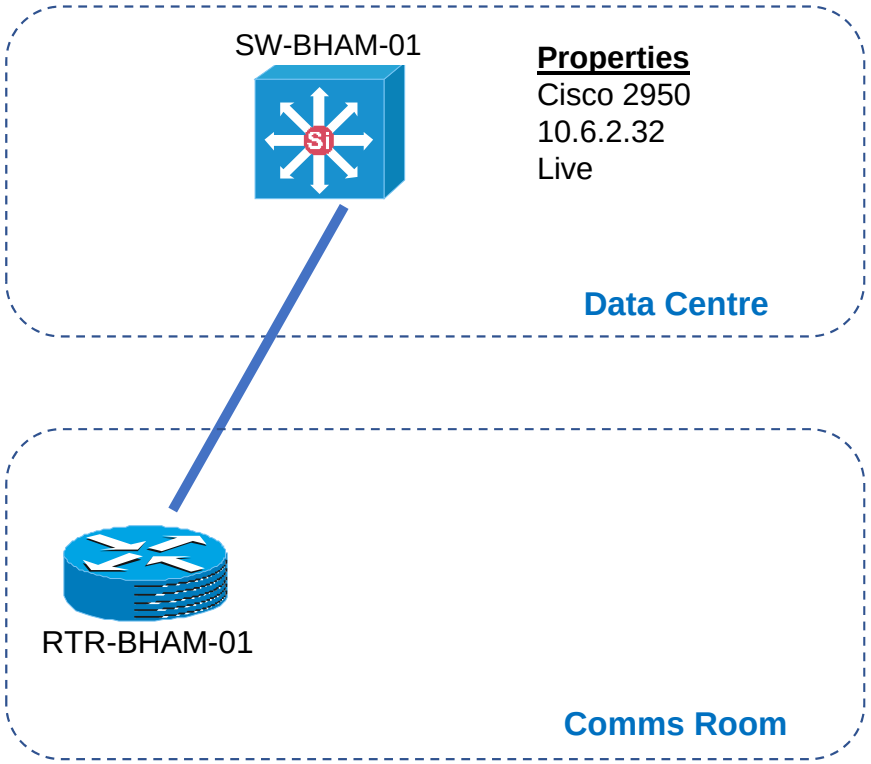
Stencils



Shape

Visio Concepts and terms

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



Visio Basics -1

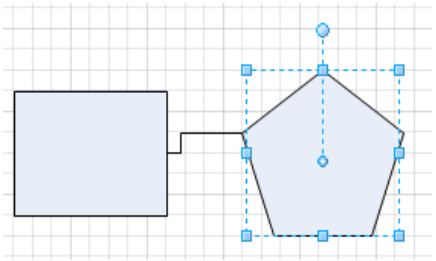
- Creating new diagram from a template
- Manipulating shapes on a page
- Aligning and Distributing Shapes
- Copy, Paste and Duplicate Shapes
- Grouping and ungrouping shapes
- Foreground and Background options
- Zooming in and Out of the Page
- Using the Drawing Toolbar to create basic shapes

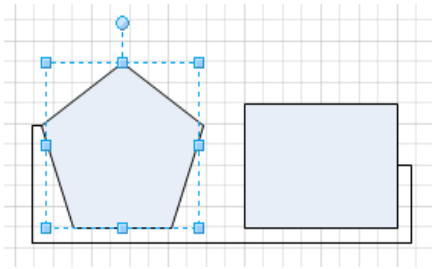
Visio Basics - 2

- 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

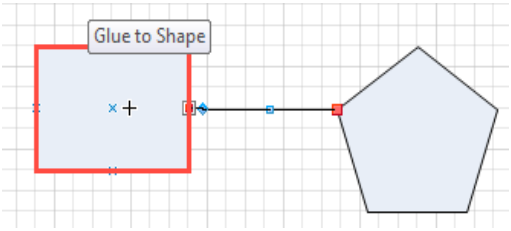
- Static glue is to a particular connection point
- The connection points used don’t move even if the shapes are moved

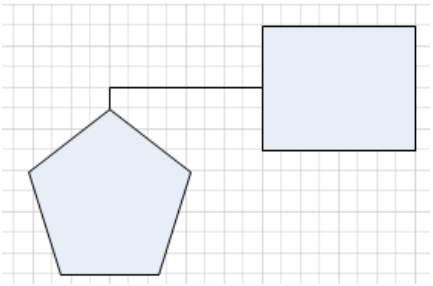




Dynamic glue

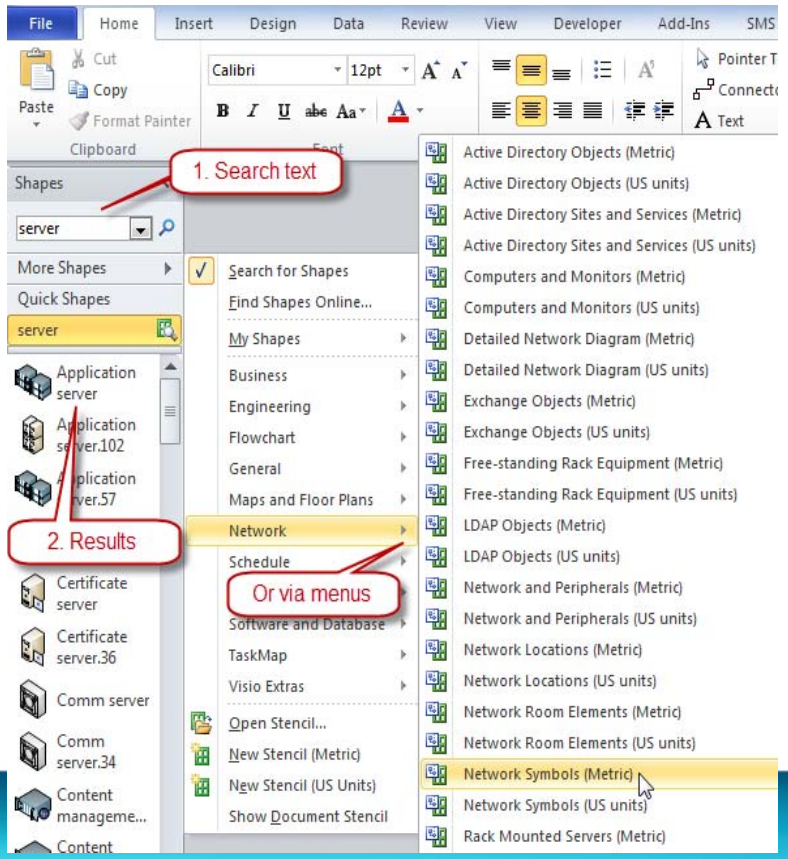
- Drag connector onto shape and wait until shape is highlighted in red
- If you move the shapes relative to each other the connection moves appropriately





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!

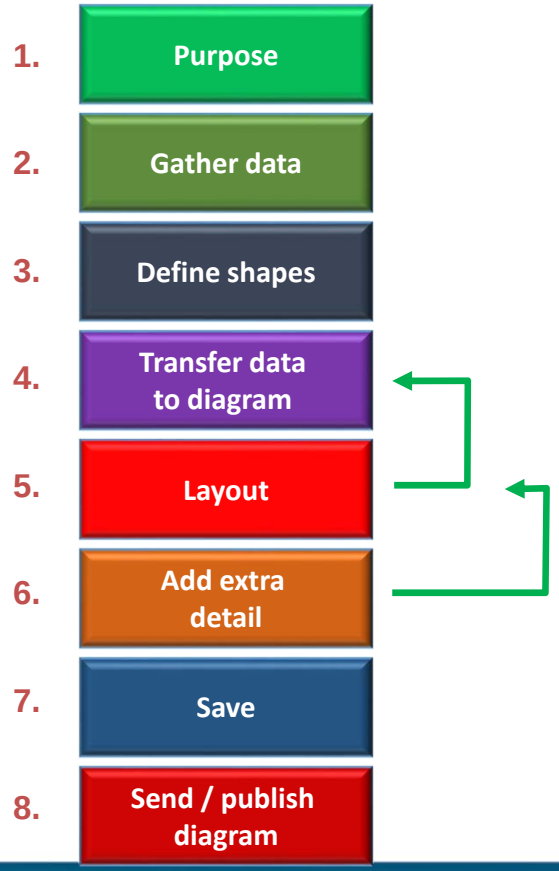
Some tips to reduce file sizes

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

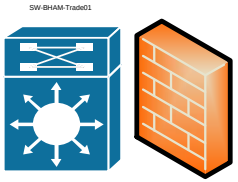


1. Which takes the most time?

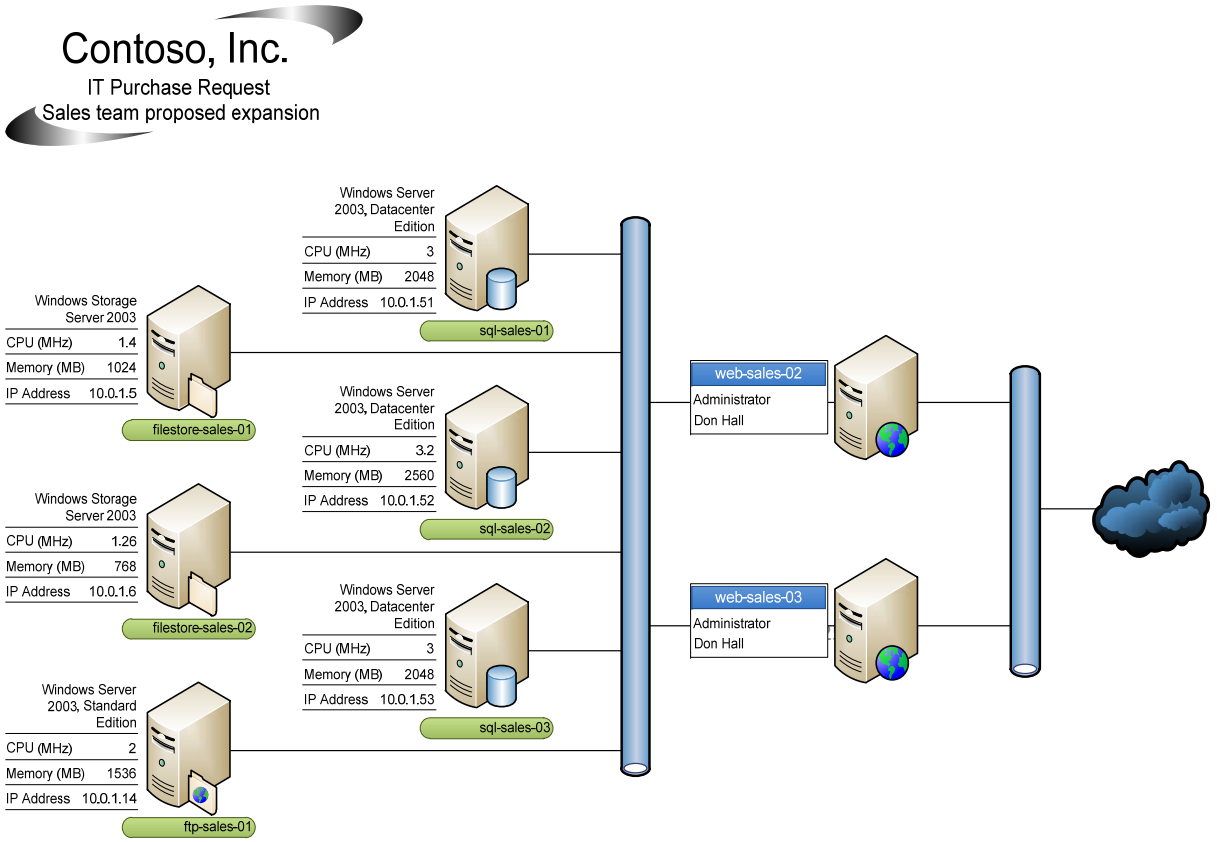
2. Where can errors creep in?

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

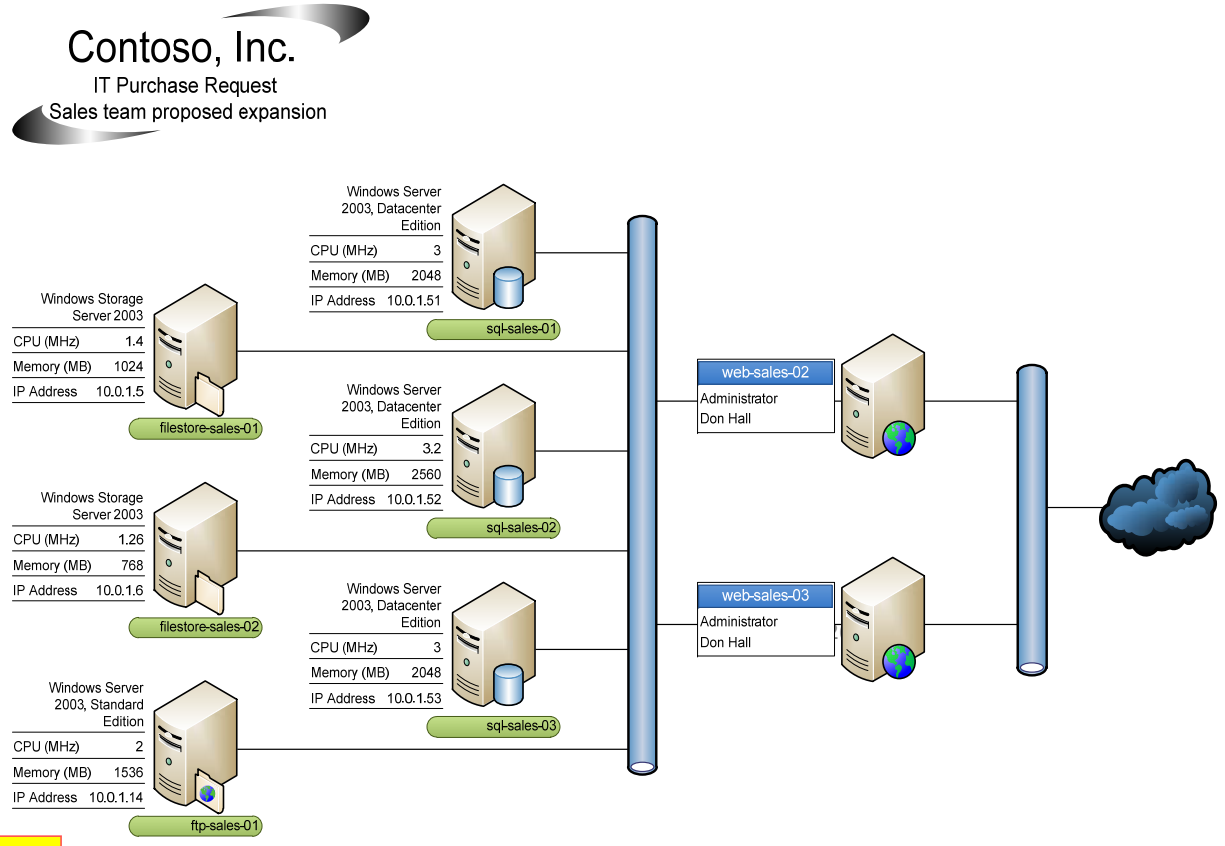


Is This A Good Diagram?



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

3. Linking Visio To Data Sources

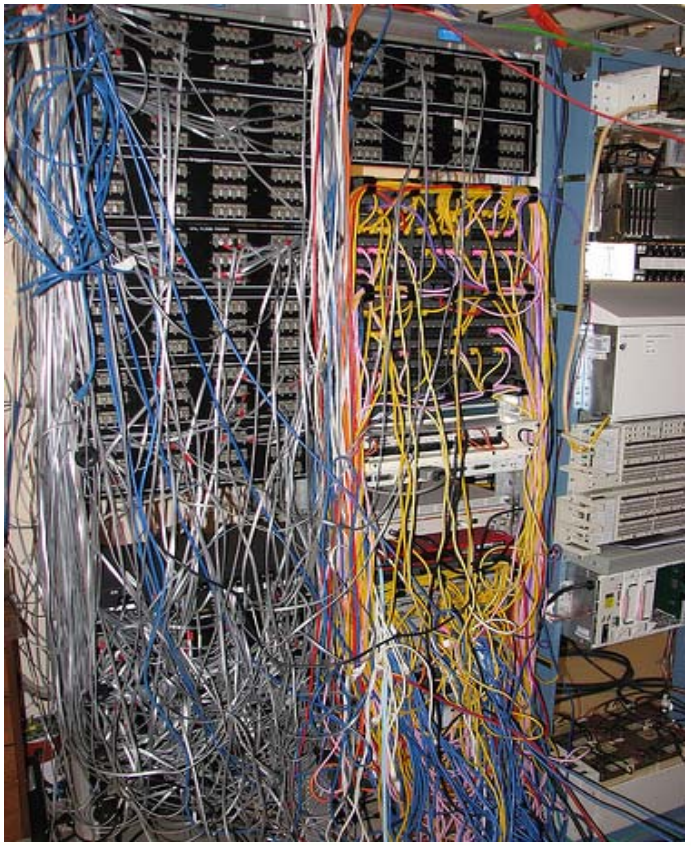
- Saves typing mistakes
- Enables refresh of data
- One diagram can serve multiple purposes
  - Less to maintain
- Multiple views of one device
  - Less to maintain
- Enables use Of Data Graphics Feature

Understanding Reality

To understand infrastructure and manage change

We need multiple views

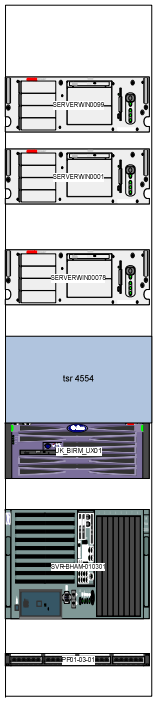
- Rack schematics
- Equipment configuration
- Physical connectivity
- Logical end point connectivity
- End device connectivity



Types Of Information / Documentation

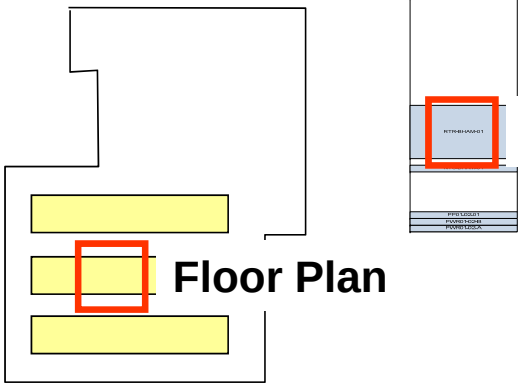
What should be updated with a server or network change?

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

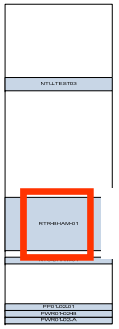


The larger the environment – the more there is….

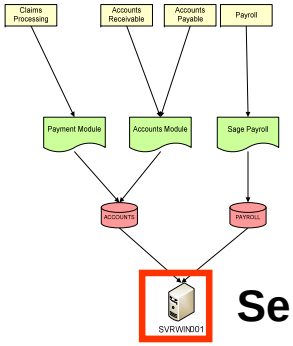
Multiple Device Instances in Diagrams



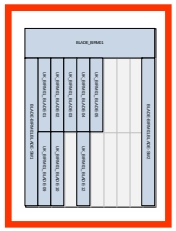
Floor Plan



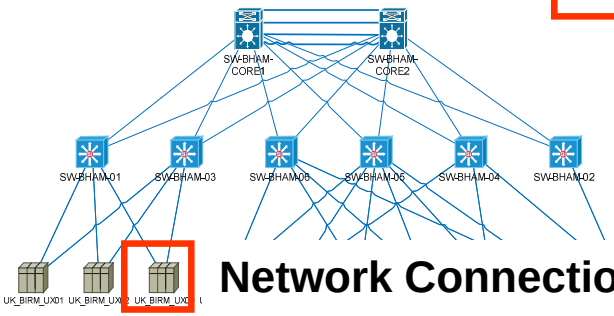
Rack Position



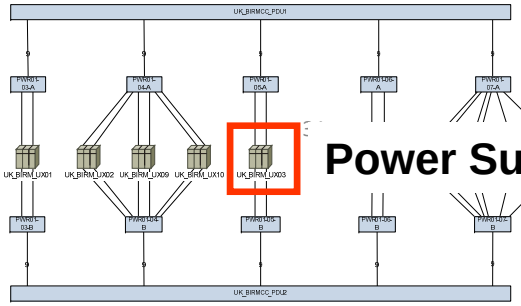
Service view



H/W Build

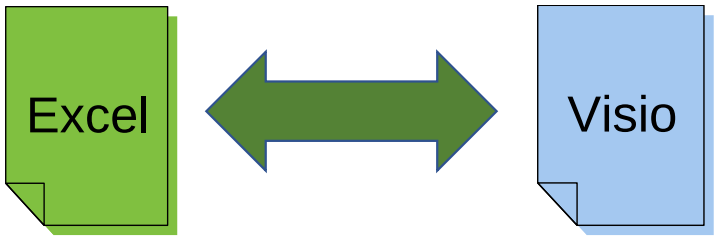


Network Connections



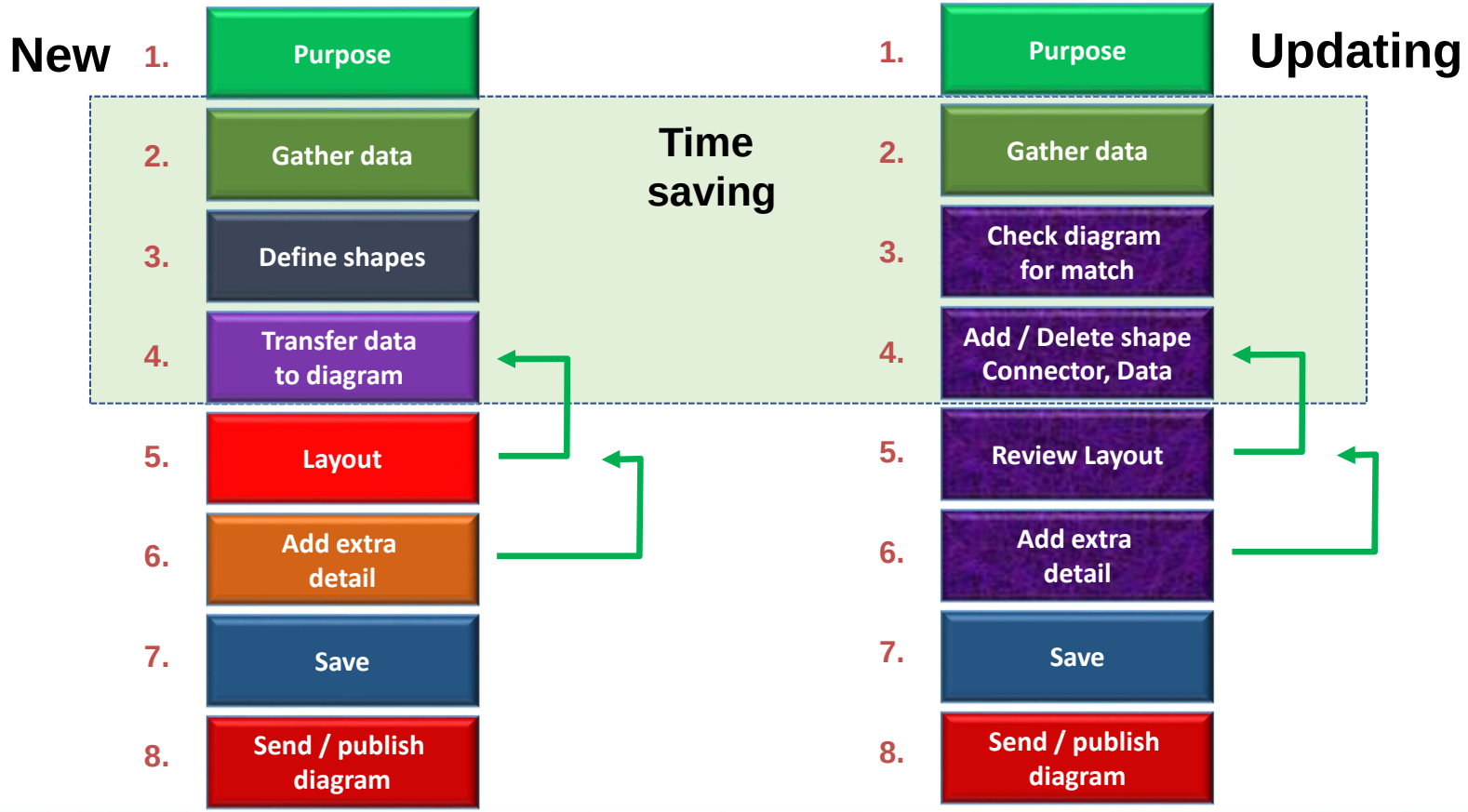
Power Supply

Reducing The Workload!



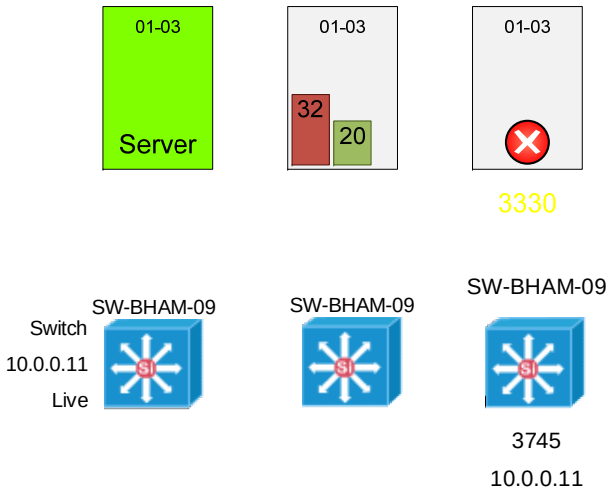
Floor box list	Floor plan
Cabinet list	Equipment room floor plan
Patch panel list	Backbone cabling diagram
Inventory	Network diagram
Inventory	Rack diagram
Inventory	Server connectivity diagram

Using External Data Sources



Visio Data Graphics

- Standard feature 2007/10/13/16/19 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
- Devices are not added / deleted on diagrams

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

1800 locations

Overnight updates

auto selection

save/publish

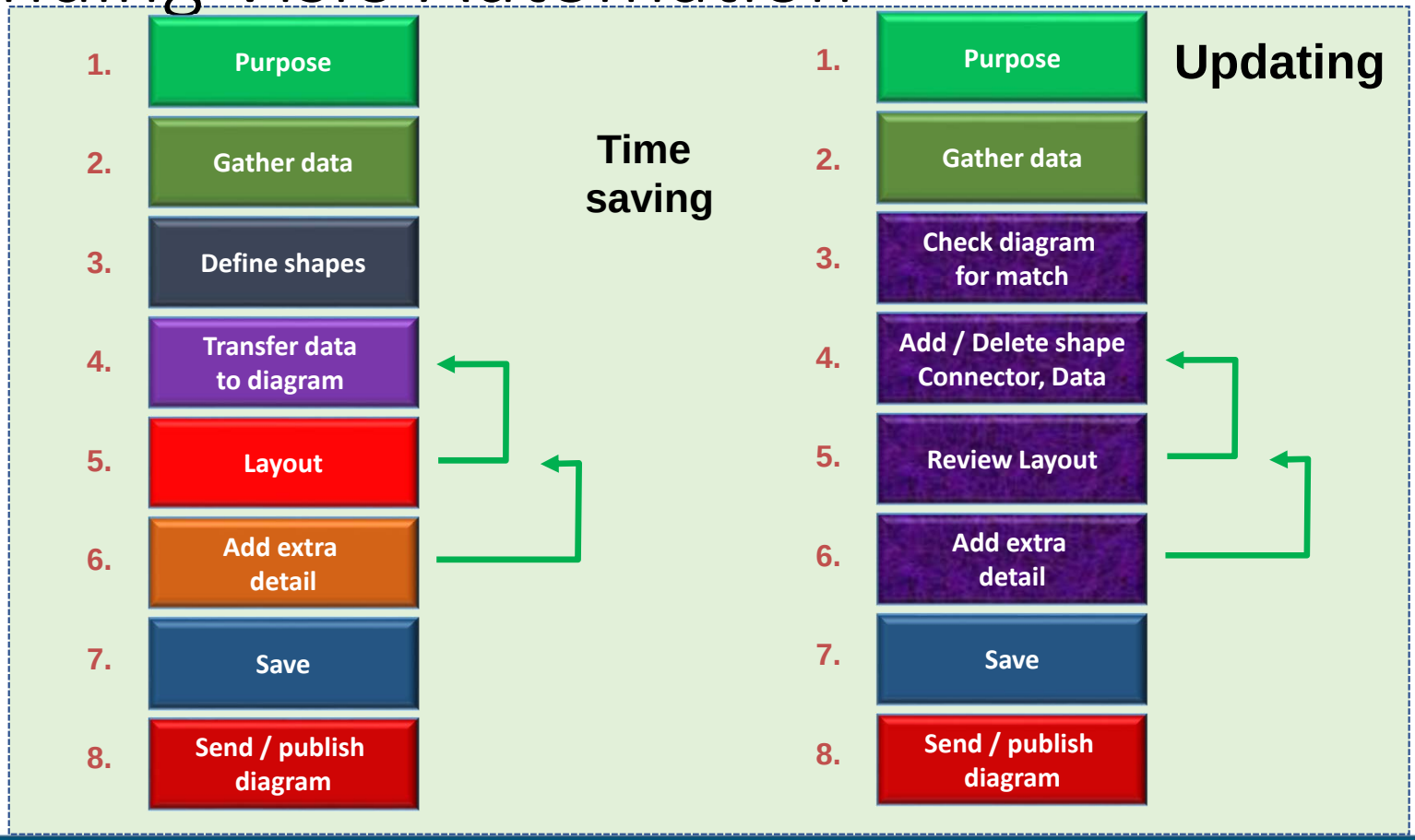
Automating Documentation - Example

- 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???

Automated Enterprise Drawing

- Should we draw and redraw diagrams in Visio or have a GUI that does this with a database?
  - Yes for simple views (i.e. 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
  - Database driven systems

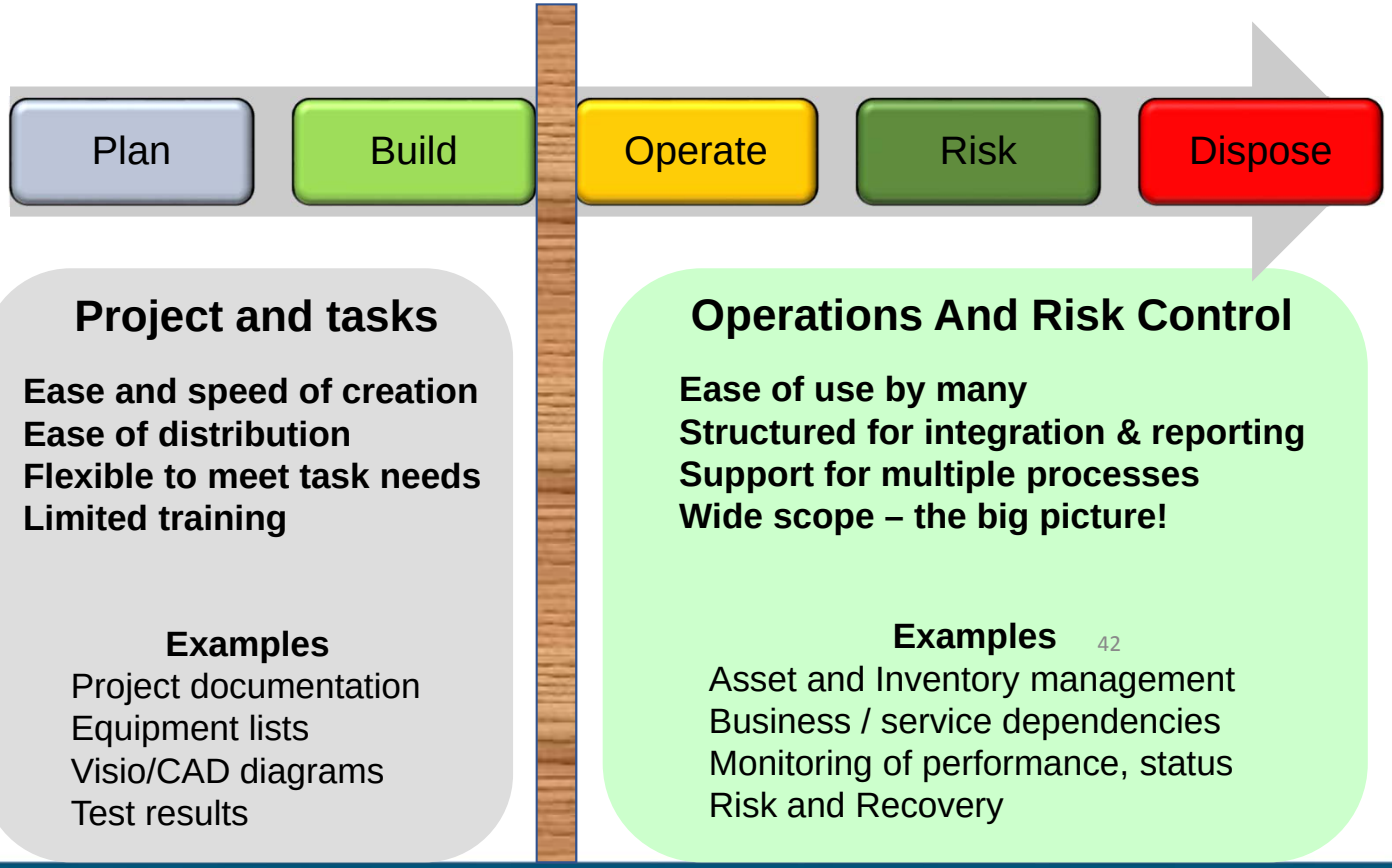
Extending Visio Automation



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

Many Infrastructure Information Needs



Infrastructure Documentation Workflow

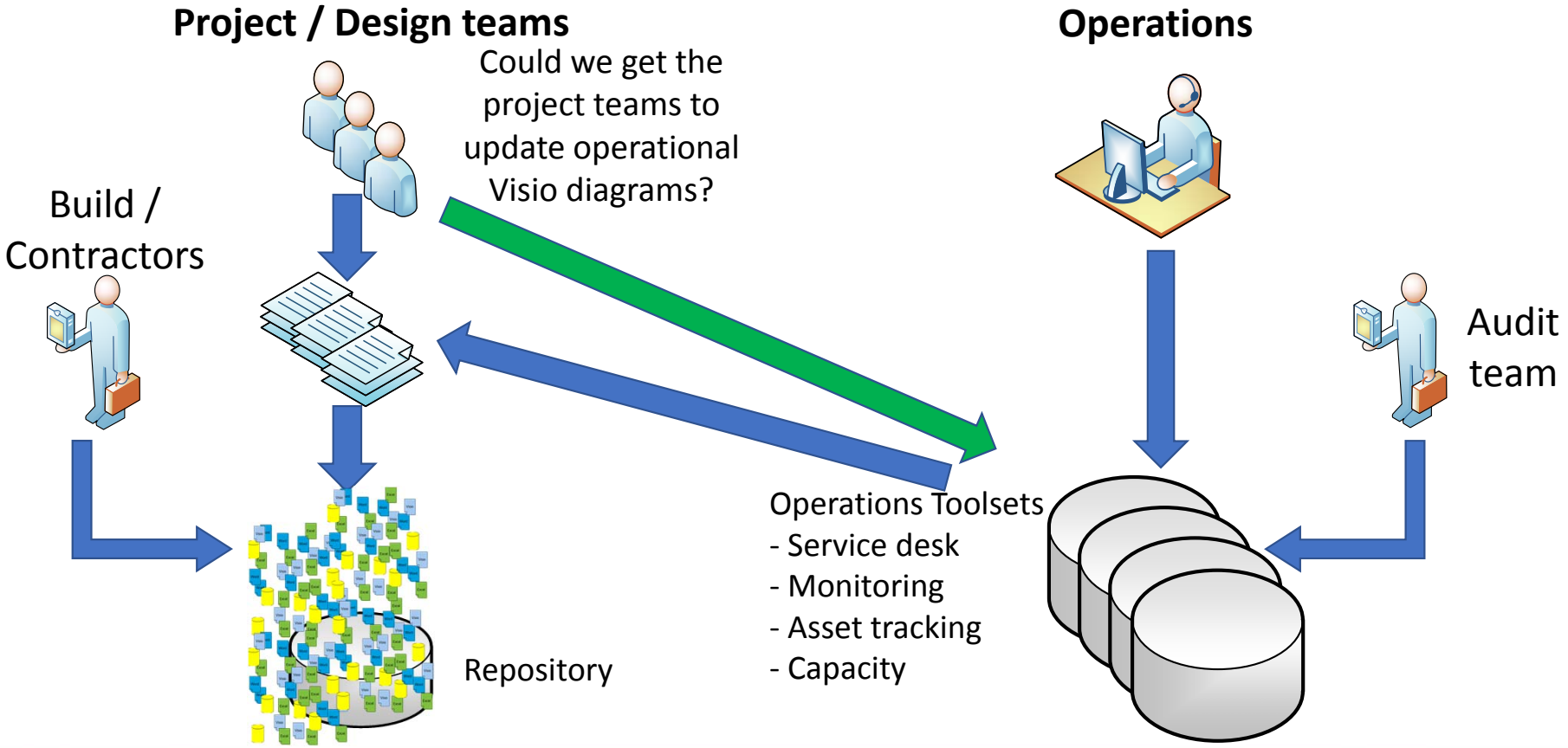
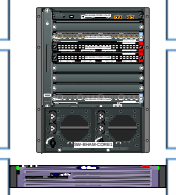
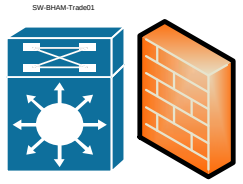


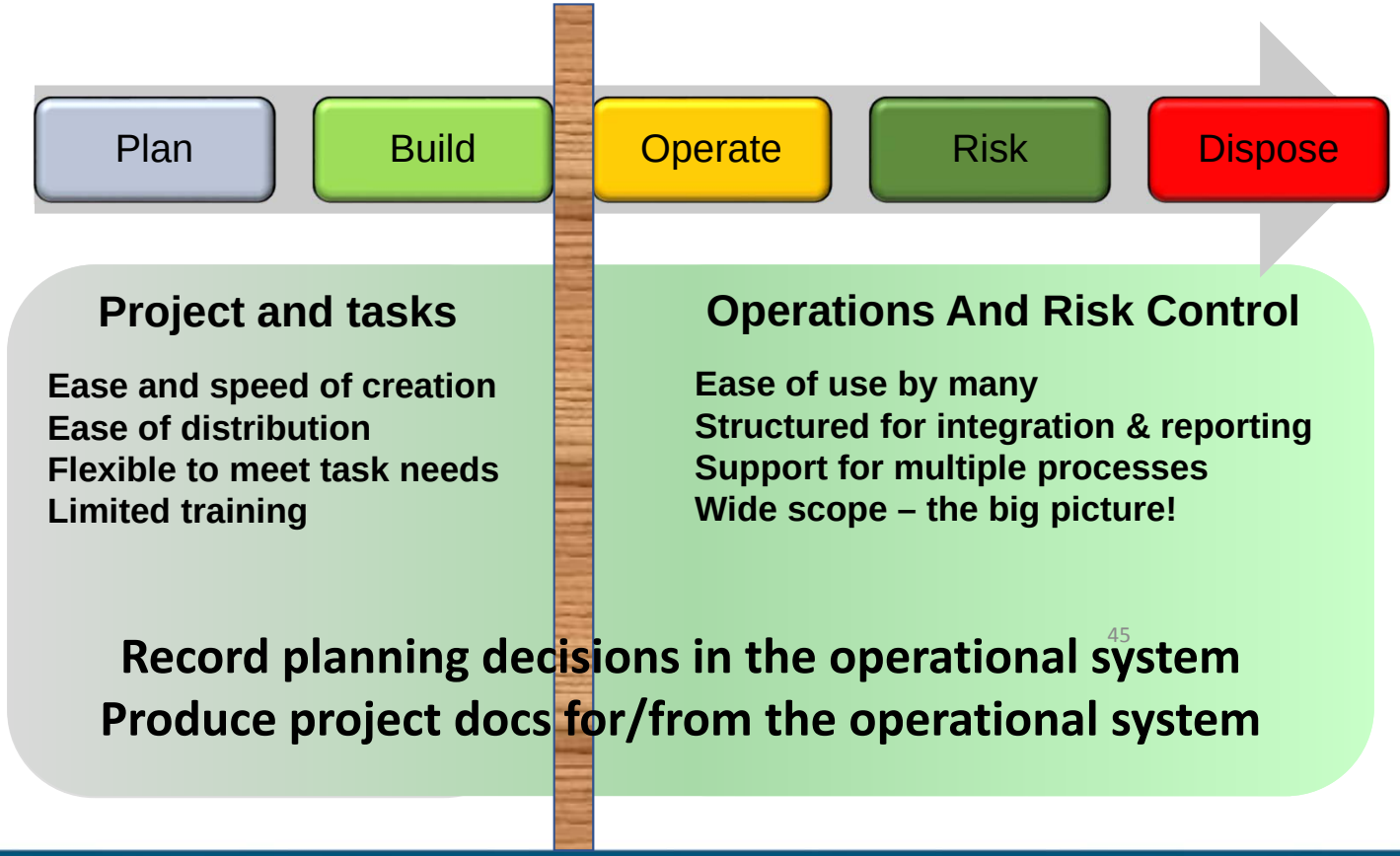
Diagram Automation Examples

1.	Purpose	Rack Diagram R01	Network Diagram Las Vegas LAN
2.	Gather data	Select Rack R01 Inventory	Switches / Router in Las Vegas
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 Las Vegas LAN
8.	Send / publish diagram	Store on server Intranet/SharePoint	Store on server Intranet/SharePoint





Maintain - Infrastructure Knowledge



Good Data = Good Diagrams

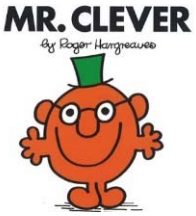
1. Establish policies, standards and ownership of data and diagrams.
   Make it simpler and easier for engineers and managers

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 as much as possible
   Save discovery time and improve consistency

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!!

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 – lots of free materials
- 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 automation and database driven systems

Additional Materials

www.microsoft.com

www.assetgen.com

Evaluation software	Free “DCIM/CMS” evaluation version
Webinars	Data center practices, Visio integration
Free Visio utilities	Data centers, network, floor plans, modular fiber

www.squaremilesystems.com

Documentation services	Downloads and videos
Training/webinars/videos	Onsite/remote Visio training, documentation methods, etc.