# Using MS Excel as a Systems Analysis Design Tool

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# Why would an organization want to go through the trouble of analyzing their system?

- Do our goals match our activities?
- Are our activities carried out in the most effective manner?
- Are the things you do in any way similar to what I do?
- Can we do it better?

# What are some of the options that can be used?

- What are their strengths?
- What are their weaknesses?
- Will it work?

# Black/White Board

- Strengths:
  - No learning curve
  - Readily available
  - Most organizations already have one
- Weaknesses:
  - Limited space to work on
  - Work in progress can't easily be reorganized
  - Can be messy
  - Work can't be saved
- Will it work? NO

# Paper on an Easel

- Strengths:
  - Same as B/W board
  - Work can be saved
- Weaknesses:
  - Same as B/W board
  - Work can be saved, but what it all means will quickly be lost
- Will it work? Maybe.
  - It can work in small groups that already have a clear understanding of the processes. As the size of the group increases and the processes become more complex, this method rapidly starts to break down.

# Hiring a “Professional”

- Strengths:
  - It is assumed that the professional has above average organizational skills.
  - It is assumed that the professional has experience in doing this type of thing.
  - People involved, at least initially, believe that leadership is serious about developing a plan.

# Hiring a “Professional”

- Weaknesses:
  - Good help is hard to find
  - Actual skills vary greatly
  - May have pre-conceived ideas about your processes
  - Likely to be expensive
  - Does not have a vested interest in your success
  - Learning curve has shifted, but still exists

# Hiring a “Professional”

- Will it work? Yes
  - While the process is ongoing, many other important things may have to be put on hold.
  - High probability, but not guaranteed

# System Analysis Software

- Strength:
  - It is assumed that it has worked in certain situations for other organizations.
- Weaknesses:
  - Possible high learning curve
  - Likely to be expensive
  - Without professional help, it is unlikely your organization will pick one that will work for you.
  - Same as hiring a professional
- Will it work? Maybe.

# Do it Yourself using General Purpose Software such as PowerPoint or Word

- Strengths:
  - Readily available
  - Reasonably low learning curve
  - Work can be saved
  - Workload can be spread out and then brought back together into a single product

- Strengths continued:
  - People involved have a vested interest in the outcome.
  - Sharing the work is likely to get a “Buy In”.
  - People involved are actually “Domain Experts”. They, better than anyone else, already know the existing process.
  - People involved already know what is working and also know what is not working so good.

# Do it Yourself using PowerPoint or Word

- Weaknesses:
  - PowerPoint and Word are somewhat linear and one dimensional, your processes are not.
  - PowerPoint & Word have somewhat limited graphic abilities.

# Do it yourself using PowerPoint or Word

- Will it Work? Maybe
  - Chances are at least as good as using System Analysis Software without the expense.

# Do it yourself using EXCEL!

- Strengths:
  - Same as DIY with Word or PowerPoint
  - Is not linear and one dimensional
  - Has improved graphic abilities
- Weakness:
  - Document sharing and collaboration is not as well developed as in Word.
- Will it work?
  - I believe that at least partial success is guaranteed.
  - The results will save time if you hire a professional.

# Back to the original question. “Why would an organization want to go through the trouble of analyzing their system?”

- Do our goals match our activities?
- Are our activities carried out in the most effective manner?
- Are the things you do in any way similar to what I do?
- Can we do it better?

# What are some of the "tricks" the ND PSC has learned using Excel?

- Use Worksheets to separate the text from the flow chart
- Expect that the charts will become increasingly complex over time
- Use the classic Flowchart symbols
- Drag and drop the Autoshapes -> Flowchart and -> Connectors submenus
- Let the "Domain Experts" gather data, let the "IT Analyzers" organize the work for presentation
- Use Color when you can; but think in Black and White
- The process strings are by nature in the form of a Summary Level Use Case
- Pictures are excellent for capturing the "Big Picture"

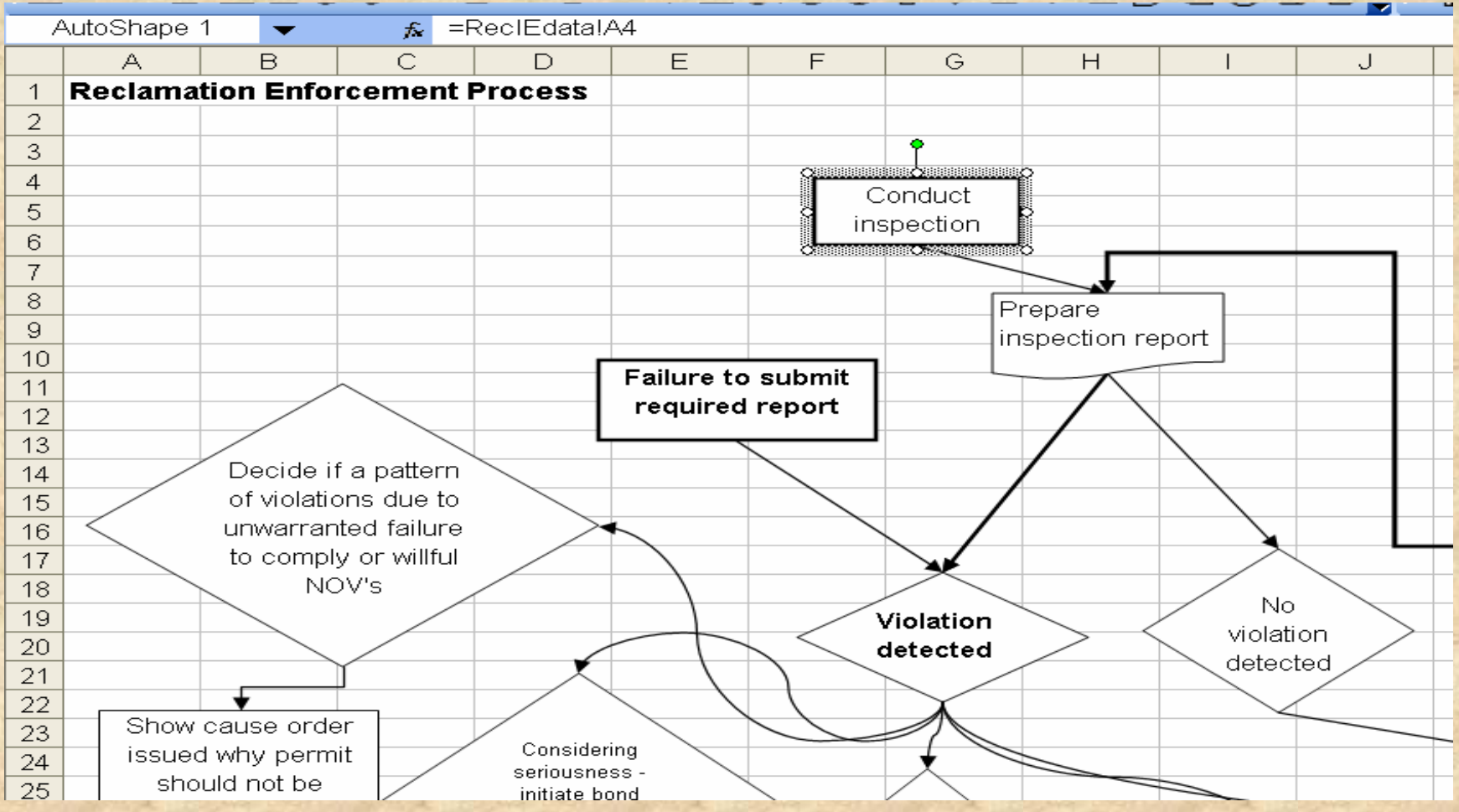
# Use Worksheets to Separate the Text from the Flow Chart

- The contents of the Autoshapes are actually a formula linking it to the data sheet.
- When you click on a task Autoshapes object, you know what datasheet the it comes from.
- Inserting a row into the datasheet causes the formula in the formula to automatically adjust!
- Separating the data sheets from its flow chart allows you to have additional information about each item while not cluttering up the graphic.
- **The same data sheet can be used to develop more than one flow chart.**

# Use Worksheets to Separate the **Text** from the Flow Chart

| | A | C | D | E | F | G | H | I | J | K | L | M | N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Process/Task** | **Action and/or Preparation By** | **Characteristic Time (ManHr)** | **Input** | **Output [preparation products; document(s) generated]** | **Category*** | | | | | | | |
| 2 | | | | | | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| 3 | **Reclamation Enforcement Process** | | | | | | | | | | | | |
| 4 | Conduct inspection | | | | | | | | | | | | |
| 5 | Failure to submit required report | | | | | | | | | | | | |
| 6 | Prepare inspection report | | | | | | | | | | | | |
| 7 | Violation detected | | | | | | | | | | | | |
| 8 | Violation, but no imminent danger or environmental harm | | | | | | | | | | | | |
| 9 | Issue Notice of Violation (NOV) with opportunity to request an Informal Conference or Formal Hearing within 30 days | | | | | | | | | | | | |

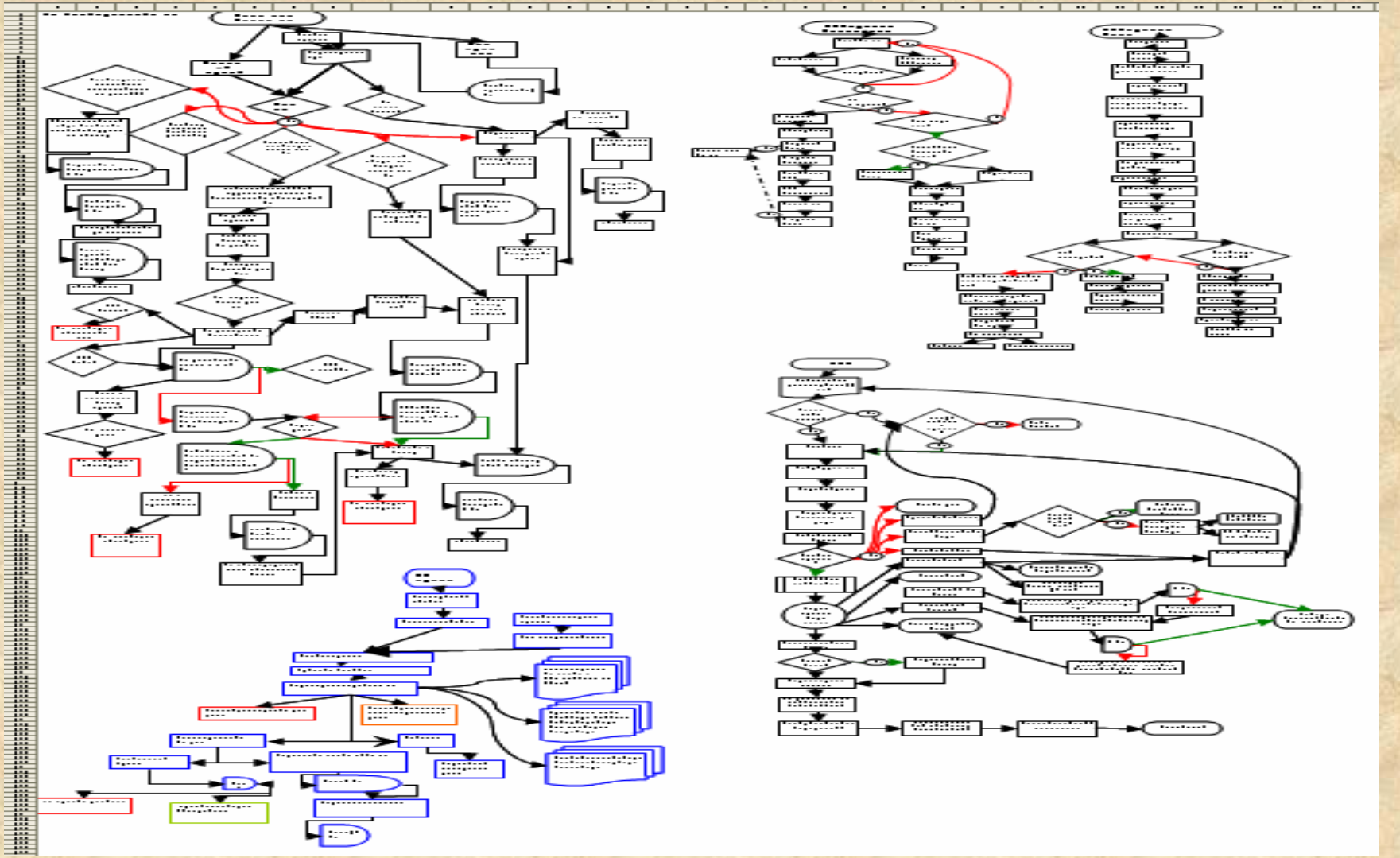
# Use Worksheets to Separate the Text from the **Flow Chart**



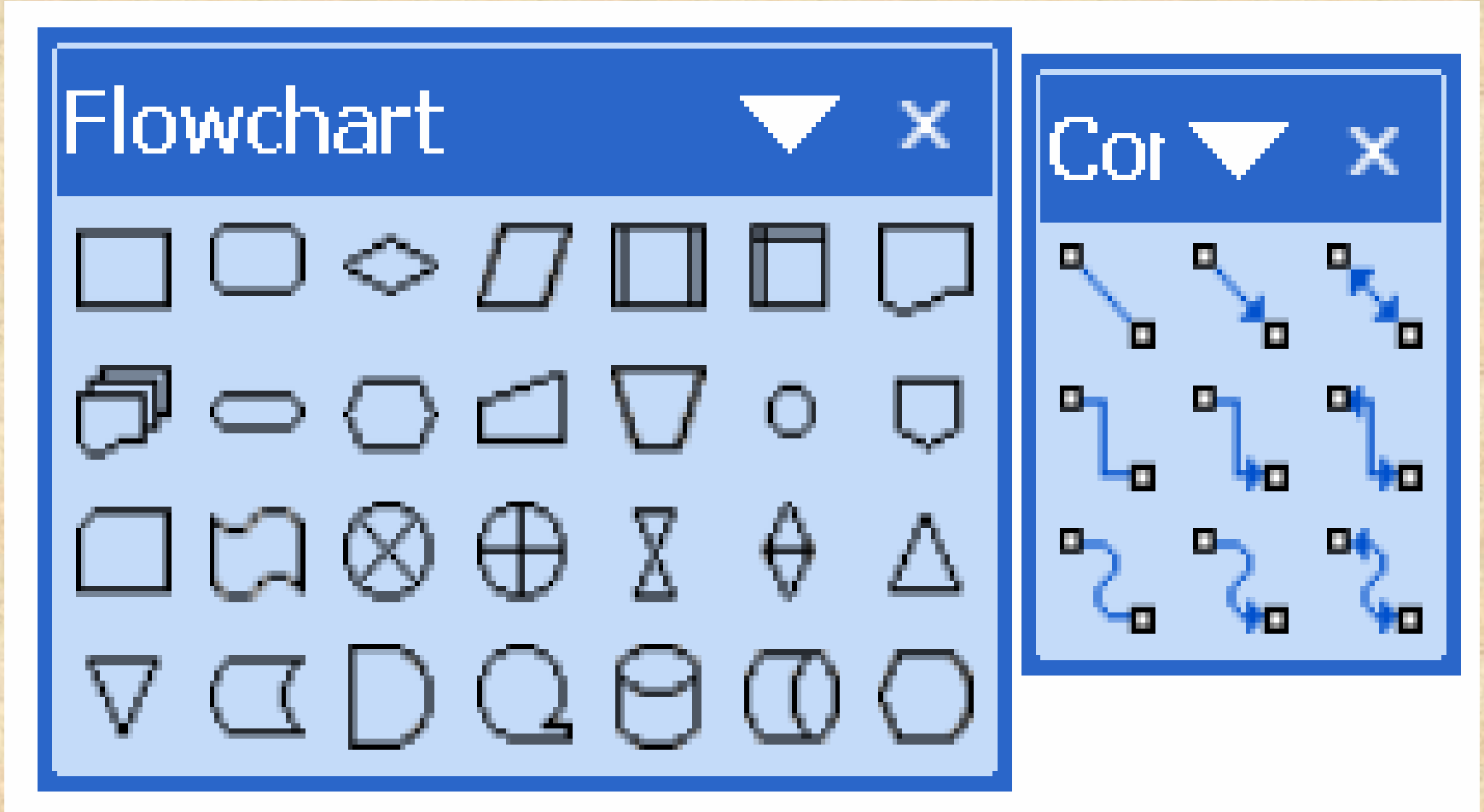
# Expect that the Charts Will Become Increasingly Complex over Time

- The “/PSC_Combined_Chart.xls” currently contains 31 worksheets.
- Too many processes on the same page makes it hard to read when printed.
- We have a number of graphic sheets that combine similar processes from different divisions on the same page to allow comparison of the steps.

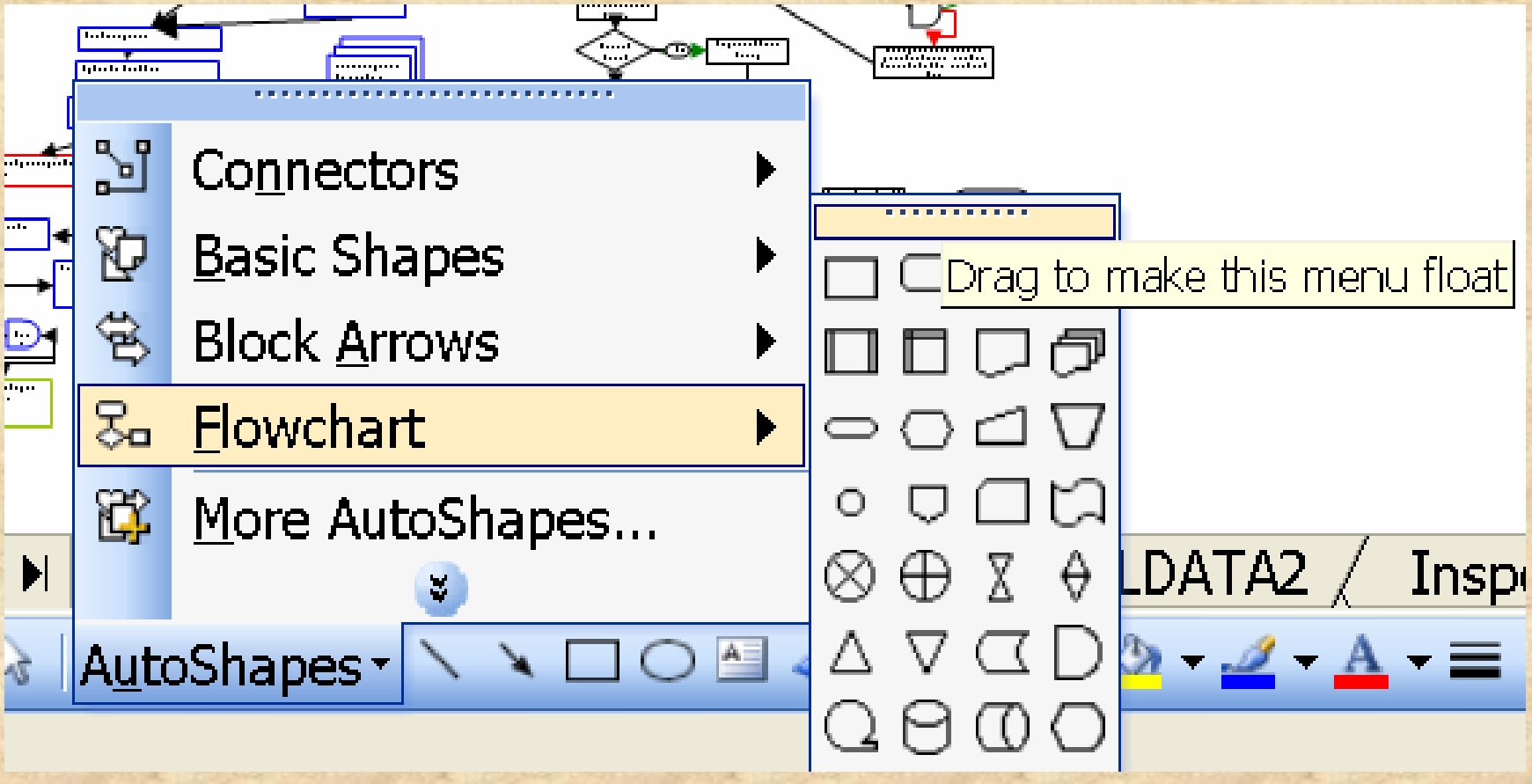
# Expect that the Charts Will become Increasingly Complex Over Time



# Use the classic Flowchart symbols.



# Drag and Drop the Autoshapes -> Flowchart and -> Connectors Submenus



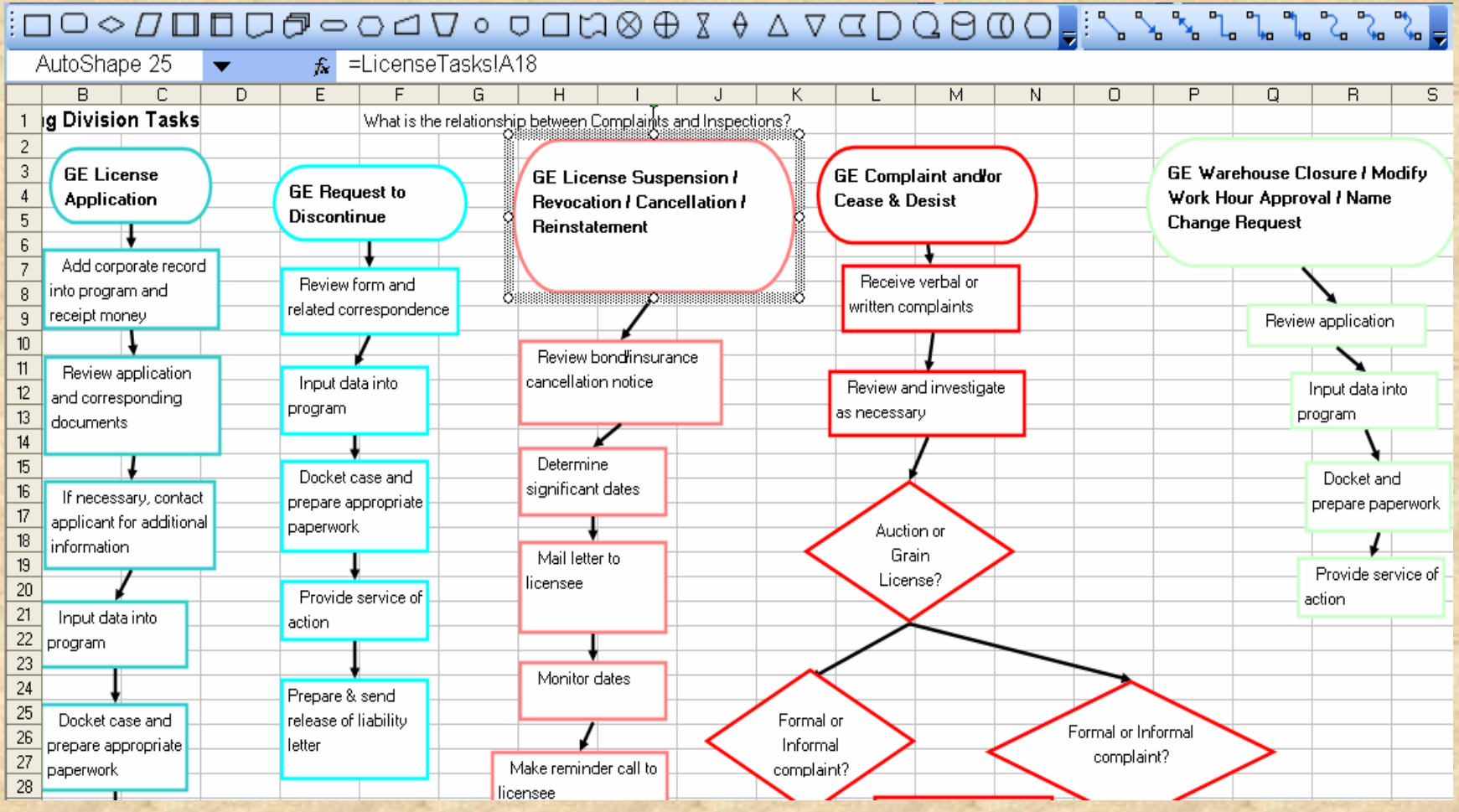
# Let the "Domain Experts" Gather Data, Let the "IT Analyzers" Organize the Work for Presentation

- The people performing the tasks know what steps are taken to complete them.
- Formal Flow Charting is not something most people have experience doing.
- You will not get any consistency in your charts, unless it is something you work for.
- Working on the charts helps you to better understand the processes and can bring in new ideas from a fresh point of view.
- It is expected that the final outcome will be used on a scale of years. Spend the time to do it to the best of your combined abilities.

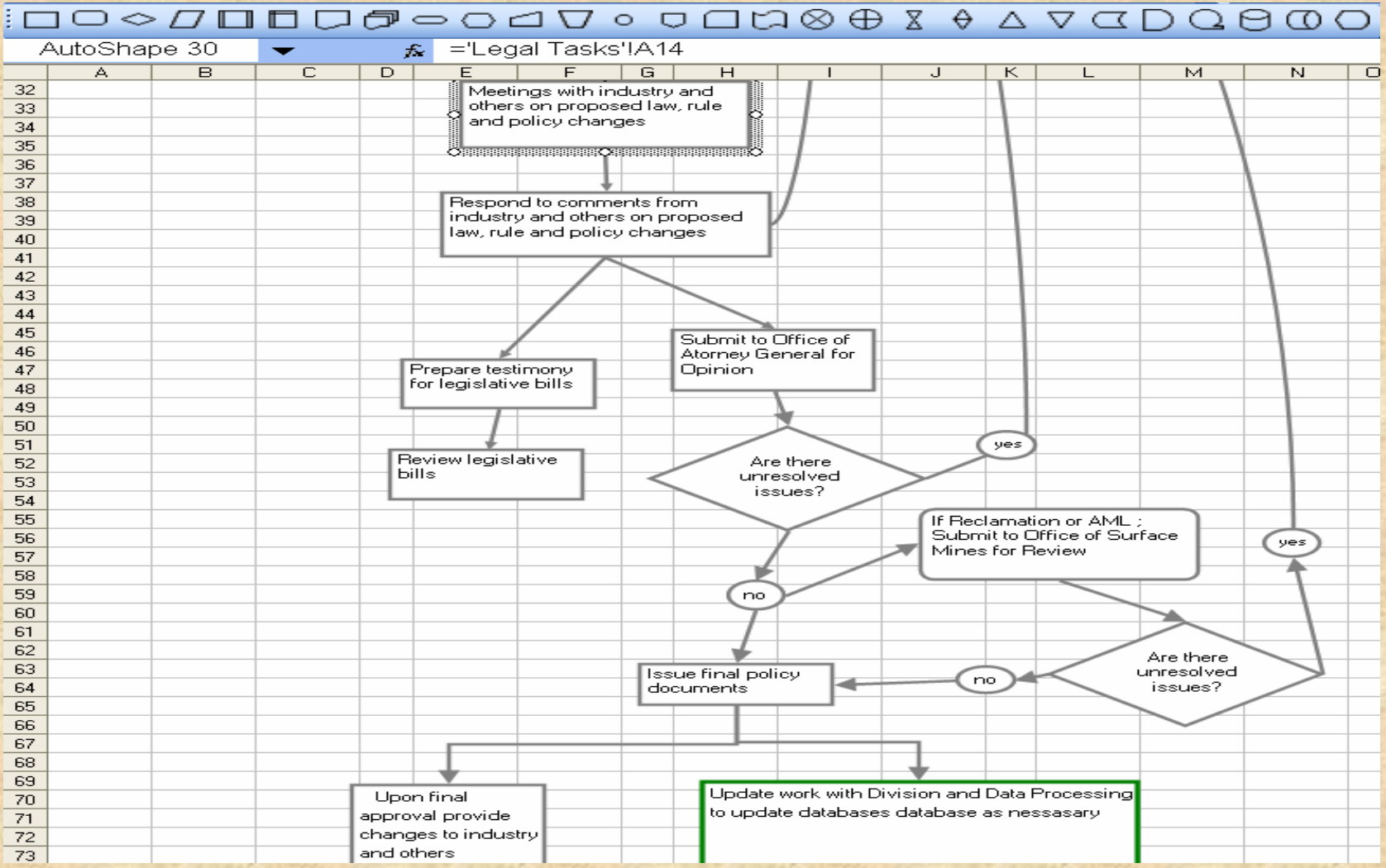
# Use Color when You Can; but Think in Black and White

- Color is very useful to separate different tasks on a page.
- Much of the real work will be done in a conference room on the overhead projector. Color looks good!
- Sooner or later some one will want to print a chart where color is not an option.
- Do not expect your colors to have any real meaning.

# Use **Color** when You Can; but Think in Black and White



# Use Color when you can; but think in **Black and White.**



# The Process Strings are by Nature in the Form of a Summary Level Use Case.

- USE CASE is a method used to capture the requirements of a system.
- A User Goal level Use Case is a hierarchal method of looking deeper into a step in the process.
- A step in a User Goal level can be broken down into functions and even sub-functions.
- Recommended reading: Writing Effective Use Cases by Alistair Cockburn.

# Graphics are excellent for capturing the “Big Picture”.

Microsoft Excel - PSC COMBINED CHART.xls

File Edit View Insert Format Tools Data Window Help

A50 5. Professional services

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | **Accounting Tasks** | | | | | | | | | | | | | | | |
| | | | | | | **Category*** | | | | | | | | | | |
| 2 | **Process/Task** | **Action and/or Preparation By** | **Characteristic Time (ManHr)** | **Input** | **Output [preparation products; document(s) generated]** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | | | |
| 3 | | | | | | | | | | | | | | | | |
| 4 | **Provide efficient and effective computer software applications.** | | | | | | | | | | | | | | | |
| 5 | Develop USE CASE summary model | Division Director, a Primary User, Developer | 3 to 24 | Time, communications, talent | USE CASE summary model | | | | | | | | | | | |
| 6 | If necessary, Develop or Extend the Conceptual Model | Data Base Owner | 1 | Time, Talent | Conceptual Model | | | | | | | | | | | |
| 7 | If necessary, Develop or Extend the Physical Database Model | DBO | 1 to 3 | Time, Talent | Physical Model | | | | | | | | | | | |
| 8 | Develop USE CASE primary task model(s) | Division Director, a Primary User, Developer | 3 to 24 | Time, communications, talent | USE CASE primary task model(s) | | | | | | | | | | | |
| 9 | If necessary, Extend the Conceptual Model | DBO | 1 | Time, Talent | Conceptual Model | | | | | | | | | | | |
| 10 | If necessary, Extend the Physical Database Model | DBO | 1 to 3 | Time, Talent | Physical Model | | | | | | | | | | | |
| 11 | Design start window | Developer | 1 to 3 | Time, Talent | Non-working Concept Application | | | | | | | | | | | |
| 12 | Review starting window with USER to determine if there are additional primary tasks | Division Director, a Primary User, Developer | 1 | Time, communications, talent | Non-working Concept Application | | | | | | | | | | | |
| | If necessary, Develop additional USE CASE primary task | Division Director, a Primary User | 3 to 24 | Time, communications | Extended USE CASE | | | | | | | | | | | |

Accounting Tasks / Accounting Flow / AML Tasks / Gas Pipeline Safety Tasks / Legal Flow / Leg.

# Graphics are excellent for capturing the “Big Picture”.

- Open “PSC_COMBINED_CHART.xls
- Start showing Accounting Tasks
- Move on to Accounting Flow
- Insert some columns
- Insert some rows
- Copy a step
- Change its formula
- Show how to add connectors

# Questions?

# Thank You!