Flo Samuels Services

flosamuel@msn.com   _www.flosamuels.com_   _510-733-3174_

Using Process Maps for Documentation and Procedures

What is Process Mapping?

Process mapping, also known as flow charting, is graphically displaying the steps in an activity while indicating the people responsible (by job title), the associated records produced (documents), and how success is measured (metrics). Steps are identified as process (action), decision, inspection, record keeping, document creation, etc. to emphasize the type and importance of each activity.

For example, the diamond represents a Decision. This Decision diamond tells the reader that a question must be answered "Yes" or "No" to proceed to the next step. The question alerts the employee to think before taking action and what action to take dependent on the answer.

The purpose of a process map is to detail the steps in the process so that people can see what they're supposed to do along with identifying improvement opportunities. For example, a process labeled "Mission and Strategy" is meaningless. You must describe what is being done during this process such as "Develop" or "Review" or "Revise," etc.

How Can Process Maps Help Your Business?

The rationale behind procedures and standards is to ensure that people do their jobs in a consistent, repeatable manner that leads to a quality product or service. Consistency is easier to control if the process is documented. Unfortunately, the result for some companies is being buried in paper. This can be avoided by looking at process maps.

What you need to identify is:

- "Who does the work?" (People responsible.)

- "What do they do?" (Activity steps.)

- "What evidence is generated that they've done it?" (Records.)

- "What evidence shows they did it right?" (Measurable objectives.)

Documentation is only necessary for those activities that have significant impact on product or service, i.e. performing the activity incorrectly can lead to significant errors. If it's not in writing, there's no guarantee it will be done correctly. Nor is there any guarantee that someone reviewing the activity, without written guidance as to what should be done, could determine the inputs and outputs that would support the activity being done correctly.

The reality is, you need documentation. The documentation can be any format that satisfies the "who," the "what," and the "how well done" criteria. Most important, however, is that employees can easily use the documentation. Based on this scenario, documentation can be a well-designed form or checklist, a process map (flow chart), a video, or pictures on the work area wall.

Flo Samuels Services

flosamuel@msn.com   www.flosamuels.com   510-733-3174

Using Process Maps for Documentation and Procedures

How Can Process Maps Simplify Documentation?

First, let's define simplify. It doesn't mean less documentation. It means more easily used and understood documentation. A process map may take up more pages than a procedure but it's easier to read. If online, it can also provide dynamic links to other process maps and instructions. While these links can also be created in Word documents, process map space limitations ensure the link isn't buried in verbiage.

Developing process maps forces the writer to address activity steps in logical order and with brief descriptions. Nothing highlights an illogical procedure faster than a decision branch that goes nowhere or one needing extensive explanation.

The usual structure of company documentation is a policy statement, a manual, procedures, and work instructions. If you read through these documents, you start seeing repetition and multiple references to other parts of the manual or other procedures or work instructions. This is just more paper for people to ignore. Worse, a lot of documentation is formalized to ensure consistency with other documents but not always readability. Let's look at some typical documents for a Quality Management System.

The Quality Policy is generally a generic statement that the company intends to produce the highest quality product to guarantee the greatest customer satisfaction.

The Quality Manual, if modeled after the ISO 9000 standards, has a section for each clause in the standard, with a generic statement that reflects the clause wording, then either references or includes all related procedures. The procedures often reference work instructions.

Most Quality Manual statements and procedures are broken into sections for Purpose, Scope, Reference Documents, Definitions, Revision History, Responsibilities, Records Retention, and recording who prepared and who approved the document. Most of this isn't necessary for understanding what has to be done. By the time the reader gets to the actual steps of the process, they've been hit with information overload. But overload isn't over because every step is written in full sentence format to make it look like a formal procedure that should be followed. Unfortunately, there's no guarantee the whole sentence (or paragraph) will be read to ensure the step is done correctly.

As an alternative, a process map can be referenced in a policy manual. The map can then list the records, metrics and personnel responsible at the appropriate steps while referencing work instructions and other process maps. Because process maps limit writing space, they reduce a procedure or work instruction to the most important details, eliminating repetition, and reducing potential errors in following the process. While the ideal situation is to have the maps and links on line, they can also function in printed form. However, to ensure printed copies are current it almost makes it easier to buy more computers so the maps can stay on-line and be printed as needed.

As an example, take the following sequence of steps (this is for changing the color of gemstones through radiation):

6.1   *Locate the gemstones to be checked in. If received as a radioactive material transfer, use ACP: 4.15.5 Gemstone Radioactive Material Transfer.*

6.2   *Verify the customer supplied instructions against the actual product.* **Warning Gemstones are very fragile and must be handled with extreme care.**

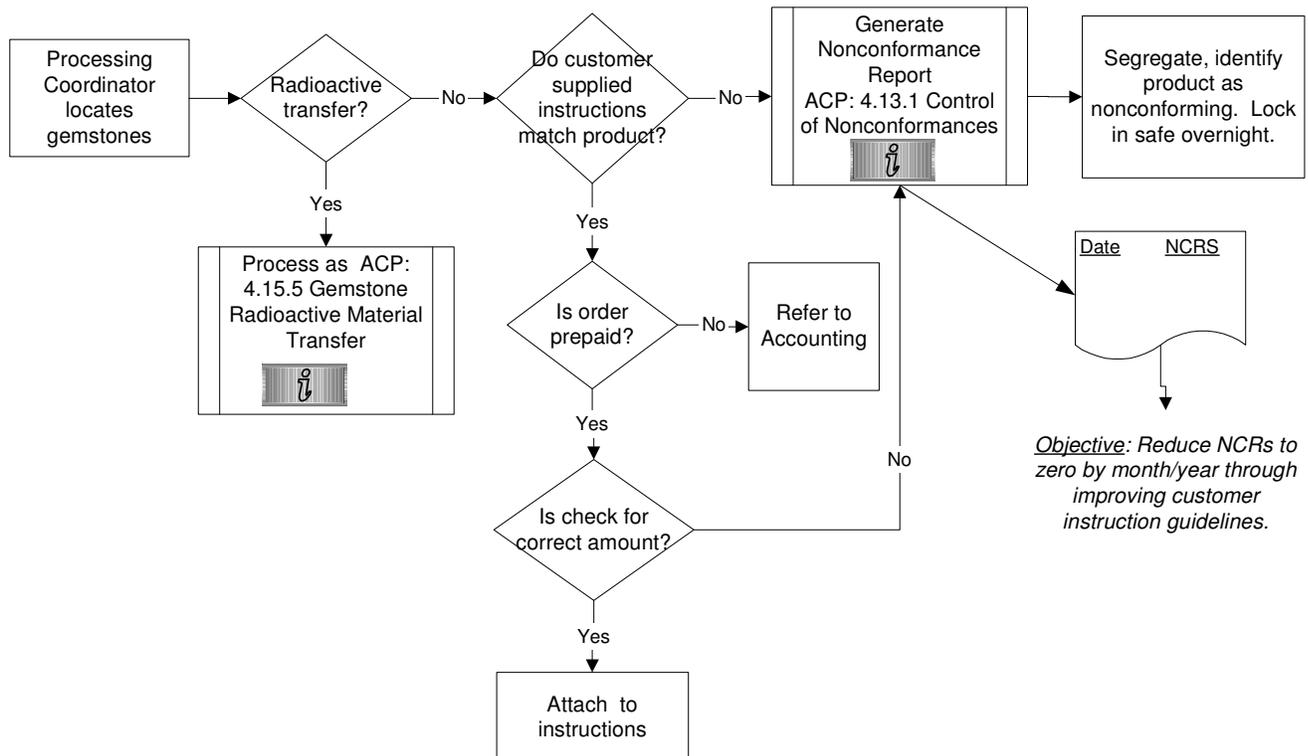## Using Process Maps for Documentation and Procedures

6.2.1　For prepaid orders, verify the check is for the correct amount and paperclip the check to the customer supplied instructions

6.2.2　If the verification fails, generate a Nonconformance Report in accordance with ACP: 4.13.1 Control of Non-conformances. Segregate and identify the product as nonconforming. Lock in safe if not resolved the same day.

6.2.3　Repeat step 6.2 when the nonconformance is resolved.

These same activities as a process map:

7.5.3 Identification and Traceability
7.5.4 Customer Property
7.5.5 Preservation of Product

Gemstone Check-In

Process Owner: Gemstone Product Manager

| Processing Coordinator locates gemstones | → | Radioactive transfer? | —No→ | Do customer supplied instructions match product? | —No→ | Generate Nonconformance Report ACP: 4.13.1 Control of Nonconformances | → | Segregate, identify product as nonconforming. Lock in safe overnight. |

Yes ↓ (Radioactive transfer) → Process as ACP: 4.15.5 Gemstone Radioactive Material Transfer

Yes ↓ (Do customer supplied instructions match product) → Is order prepaid? —No→ Refer to Accounting

Date　　NCRS

Yes ↓ Is check for correct amount? —No→ (to Generate Nonconformance Report)

Objective: Reduce NCRs to zero by month/year through improving customer instruction guidelines.
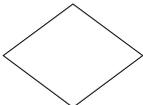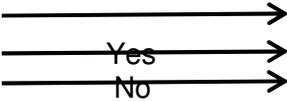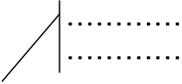
Yes ↓ Attach to instructions

Note that while the process map takes up the same, if not more, space as the written instructions, each step is distinct, the responsible person is identified, records are identified, and direct links are provided to other referenced processes. More important, it's easy to follow.

Using Process Maps for Documentation and Procedures

The Basics of a Process Map

Most maps will use six to seven basic elements:

Activity	Element	Description of Information in Element
Process		The activity such as "Customer Contacts Sales/CSR and Requests Product"
Decision		A question requiring Yes or No as the answer. Each answer leads to a different process or another decision. "Is the product currently offered by the company?"
Connectors	Yes No	Plain is showing the direction of the process. If coming from a Decision element, the "Yes" and "No" lead to the process that reflects the response. "Yes" leads to "Create a Purchase Order," "No" leads to another flowchart describing the design process.
Document		To list documents used with the process or a document that is produced from the process.
Off-Page Reference		Used to reference another flow chart.
Annotation	…………… ……………	For comments or instructions relative to the process or decision.
Terminator		To indicate the end of an activity or process. Many use the final process activity to indicate process end and use the terminator to end a decision branch. "Does customer buy product?" A "No" answer would connect to a terminator with "End" inside the element.

General Tips for Developing Process Maps

- Everyone has to participate. If employees don't understand the whole process and how their activities fit in they see no need for a procedure or finding ways to improve the process. By understanding what it takes from ordering to delivery of materials to ensuring the tool is calibrated to production of the part to inspection and delivery to the customer, they can see where they fit and why they need to be consistent.

Flo Samuels Services

Using Process Maps for Documentation and Procedures

- Employees have to own the process. People will not embrace following a process or process improvement if they don't have a voice in how it's accomplished. Statistically, 67% of process improvement projects fail within the first year due to non-integration of those who carry out the process in developing the improvement. This figure can reach as high as 85% within three years.

- In mapping processes, you must always map what is, not what should be. Even if two people do the same process differently, do not map one and ignore the other. Map both as alternatives to the path. You will deal with the "should be" at a later date (also called "improvement opportunities" or "process re-engineering").

- In process mapping, the objective is KISS. Don't try to determine every step to a process when you start. Map the normal steps to the process, then take each step and analyze it for alternative and exception paths.

- Alternative paths are the possible things that can happen when a person has choices or a decision has to be made. Exceptions are problems that can delay or stop the process. Using software as an example, a person can enter their name to access the system (normal path). They can also enter an identification number (alternate path). The alternative path alters the process but, in this case, the result is the same—entry to the system. Another alternative would be the person abandoning the entry attempt. An exception is they enter something the system can't interpret and it rejects them entirely. Some alternatives will involve two or three steps. Other alternatives may require an additional process map. As these complexities are defined, so are the organizational system and inter-linking relationships.

- Before trying to use process mapping software (such as Visio), use a word processing program to record steps in narrative format, one line under the other. Indent the sub steps under each main step. For decisions, such as "does the patient have insurance," place question marks on both sides of the question. Record the answers on separate lines, with "Yes" first, then "No." Each answer will have an action or actions to take and these are listed on separate lines. "Yes, get card, copy card, return card." "No, get payment information, credit card number, etc."

The purpose of the narrative format is that it simplifies putting the statements into a process map format by cut and paste between programs. Once you understand the logic, you can use the process mapping program without the word processing preliminary. (Strong advice: when creating process maps, do not use programs not specifically designed for process mapping—the pain is not worth the money saved.)

Define Your Primary Processes

Take a macro/system look at the activities in your organization from the time a customer enters the system to the time they leave. This is the process path for the system. Each of these activities will be broken into secondary and tertiary processes with all their possible divergences. For example, in a doctor's office, the system processes are intake, exam/testing, follow-up, and billing.

Using Process Maps for Documentation and Procedures

Define Your Secondary Processes

Break each major process into a straight-line path that most approximates a normal operation. Using the above example of intake, the straight line is patient sets an appointment, patient arrives at office, completes paperwork with insurance information, patient chart is started. Identify who is responsible for steps in the process by assigning job titles, not people's names. One method is to identify the job title that starts the process and only indicate new job titles where they perform that step. The objective is accountability—who has to ensure the steps are done correctly? Include all actions such as inspection, creation of a document, data entry, etc.

Analyze Each Step for Alternatives and Exceptions

Continuing the example of a patient in a doctor's office, an alternative within the Intake process might be that the patient does not have insurance information. If this can be handled as a two to three step process, it would be included in the main process map (as part of a decision branch). If handling this exception involves many steps, it would be a separate process map referenced in the main process map.

Exceptions would be that the patient does not have insurance and does not have the financial resources to pay. In this case, the process would be terminated and the patient referred to government clinic resources. This would be shown on the map by a shape indicating termination.

Note Improvement Opportunities

While mapping the process, you'll see bottlenecks, unnecessary activities, and unanswerable questions. Note these as improvement opportunities by attaching a comment. In the comment, note the problem associated with the step but **do not** suggest a solution. Brainstorming with employees will elicit many ideas, some of which may be better than the one you might have proposed. In addition, brainstorming involves employees in the solution, making it more likely they'll support its implementation.

Verify Each Step, Alternative, and Exception

Once the process is mapped, have each employee involved in the activity perform each step. (In large organizations, it's not always possible to have everyone be part of the total mapping process). If you observe each step as it's performed, you can catch inconsistencies that will be glossed over in a visual review of the map. Does everyone perform the steps in the same sequence? Are there alternatives they have experienced that are not in the outline? Are the resolutions to alternatives and exceptions consistent among co-workers? Where you find differences, you have improvement opportunities.

Indicate Metrics

Once the process is finalized, indicate related objectives at the step where they will be measured and the metrics that will be used to verify that the objective was met. Keep in mind that there's a difference between good data and data that looks good. Maintaining a standard of one error per 10,000 actions looks good but not if this is accomplished by having twice as many employees as needed. Another way of looking at this metric is one error per 10,000 actions looks good but not if the other 9,999 actions are correct but consistently late. Objectives must

Using Process Maps for Documentation and Procedures

reflect the company's core business and profitability while also enhancing customer satisfaction and continual improvement.

A Note:

Objectives cannot be static or there is no improvement. If objectives don't change from year to year (or even month to month), the business management system is not dynamic.

Physically Mapping the Process

As noted, process maps are composed of shapes such as squares, diamonds, circles, etc. that have a specific meaning dependent on the process mapping program used. While it's not necessary to use the software program's shape definitions, it reduces confusion for outsiders looking at your system if the maps reflect industry norms. The important point is that each shape has a consistent meaning in the organization.

Consistency is also needed for how steps are stated, and how the map flows. For example:

- In general,
  - o Plot maps from left to right or down and up not both ways. This must be consistent for all maps in the company.
  - o Identify the process owner (the title that makes final decisions) at the top of the map.
  - o The map name indicates the Purpose and Scope of the process. The first line of the map's title identifies the major activity within the company to which the process relates, i.e. production. Under it, the process name should clearly define what the process is for, i.e. milling.
  - o Links are Reference Documents such as tool manuals.
  - o Connect all shapes with a connector line or a decision response line (Yes or No)
  - o If your map looks like a super highway interchange with connectors crossed over other shapes or elements squeezed into every corner you have too many operations on the page. Redraw the map or break up the process into sub-processes.
- Actions
  - o Are generally a rectangle.
  - o Are stated in sentence format (capitals are only used to start the sentence).
  - o Are in 10 point normal typeface.
  - o Start with an action verb with minimal use of prepositions.
  - o Include the job title responsible for the action.
- Decisions
  - o Are generally a diamond.
  - o Must pose the question so that all "Yes" responses go one way (down or to the right) and all "No" responses are the other way (to the right or down). This will apply to alternatives and exceptions to the normal path.

Using Process Maps for Documentation and Procedures

- Documents
  - Are generally a square with a wavy bottom
  - These are documents generated by the process, such as records or travelers.
  - Must be identified with the company acronym, i.e. Form ACS 4.2 or Training Records
- Starting and ending activities
  - Are generally an oval.
  - Describe what starts the process (input) and what ends the process (output). This is also used to indicate termination of the activities due to an exception.
- Comments
  - Should be in a separate shape (for example, the Annotation shape in Visio).
  - Should be connected to the step at a point that doesn't interfere with connectors.
- Data (metrics)
  - Are generally a parallelogram but can be other shapes dependent on the program and data type.
- Links
  - The name of the process or work instruction related to a link should be identified in the step where the link resides.

If needed, a centralized system can hold revision history, definitions, and preparation/approval information. Record retention requirements should be in a "control of records" procedure. The map has now eliminated two or more pages of procedure information not needed by those responsible for completing the work.

ISO Documentation

If the maps are being created for ISO certification, the title should reference the ISO requirement covered. Below is one convention that has passed muster in audited companies. Clause and Sub-Clause refer to the ISO requirement. Examples follow.

- One digit main clause number and title.
- Two-digit sub-clause number and title.
- Three-digit sub-clause number and title (clauses can be combined if the map covers them).
- If multiple products use separate maps and identify the product.
- For each sub-process and sub-sub-process, add a digit to the numbering system and the title.
- All upper case and bolded. All centered.

Flo Samuels Services

flosamuel@msn.com   _www.flosamuels.com_   _510-733-3174_

Using Process Maps for Documentation and Procedures

Examples:

6: RESOURCE MANAGEMENT
6.1: PROVISION OF RESOURCES

7: PRODUCT REALIZATION
7.2: CUSTOMER RELATED PROCESSES
7.2.1 AND 7.2.2: PRODUCT REQUIREMENTS/ DIVISION X PACKAGING
7.2.1.1 NEW DESIGN

Baseline the Process

Once the process is defined, <u>before</u> any improvements, baseline it, i.e. define it and all related material as the original documents to which all changes will relate. Verify that metrics are useful, usable, consistent, and will accurately reflect improvements and meeting objectives, then baseline them, preferably on the process map. You now have a living document that not only will change over time but can be used as an instructional tool as well as a visual motivator.

Conclusion

Neither procedures nor process maps will ensure people do everything correctly. However, it is much easier to spot problems in a process when looking at pictures then when looking at words. Most important, for the average employee, a picture is worth a thousand words. Just think of the words you can eliminate through process mapping.