Adding detail to a process analysis with SIPOC-R

I was talking with a Director from Facilities Management, and we were looking at some repeating issues that they have been dealing related to building maintenance. The issues they are seeing can result from a number of different root causes, but one could be the failure of critical parts in machinery. For Facilities to improve their service and keep the buildings in top shape, they need to identify where poor quality parts are entering the system and take steps to keep them out of the inventory. Where do you start looking when you encounter a situation like this?

The SIPOC-R document

A great tool for developing an understanding of what goes into and comes out of a process is the SIPOC-R. It is a document that is used by process improvement teams to identify what parts and materials are flowing into a service process and who is responsible for those inputs, what results are being generated during the process, and who receives the outputs. The SIPOC-R acronym stands for:

- Suppliers
- Inputs
- Process
- Outputs
- Customers
- Requirements

Each of the categories on the document is pretty self-explanatory, but for clarity, let’s look at what information goes into each one.

Suppliers

This section of the document lists all of the suppliers that provide any and all inputs into the process. In a service environment, these are the people who provide the information, supplies, equipment, tools and other things that are used to deliver the service. I start by identifying the inputs first, and then work backward to identify the suppliers of each one.

The purpose of having this information is that if you identify inputs that are not meeting your expectations or are causing service failures, you can go back to the supplier and work with them to make improvements or find alternate solutions. In some cases, you may even find that you need to work with a different supplier who is better able to provide you with what you need.

On the SIPOC-R document, I usually assign a number to each supplier. This number is then added to each of the inputs in the next section so that I can easily identify which one(s) come from the various suppliers.
**Inputs**

At different points in every process, inputs are fed in and used to deliver services. The inputs will vary from service to service, but can include things like information customers write on a form, data from a database, office supplies and equipment, computers and software, materials handling equipment, building maintenance supplies, and vehicles.

The purpose of this category is to help identify all of the inputs that could potentially have an impact on the service being provided. Some inputs are more critical in delivering a service than others, but they all play a role and could potentially impact the results that are delivered to the customer.

As I mentioned before, I usually start by listing the inputs into a process before I start identifying the suppliers. It has been my experience that people are more familiar with what is going into a process than with the suppliers themselves, so they are less likely to miss anything if they start here.

**Process**

The process section provides a very simplified, high-level process map. The purpose of including this on the SIPOC-R is so that someone who is not familiar with the process can get an idea of how everything flows and provides context for all of the inputs / outputs shown on the document.

**Outputs**

Like the inputs, at certain points in every process, outputs are generated. Some of these outputs are used in process steps further downstream (and become inputs to those steps), while others go directly to the end customer. In service processes, these outputs could be things like completed forms, a student enrolled in a class, data entered into a database, printed documents or reports, information that is verbally relayed to a customer, a completed delivery, or even a product like an identification card.

The purpose of this category is to identify all of the things that come out of the process and go to an internal or external customer. Once the list of outputs has been created, it becomes easier to identify the customers who receive them. As with the inputs, it has been my experience that people are more familiar with what is coming out of their processes than with their customers, so they are less likely to miss anything if they start here.

It should be noted that some people prefer only to show the outputs that go directly to the end customer, rather than showing outputs that go to internal customers. What you put on the SIPOC-R is up to you, and the amount of detail you include will be driven by what you are trying to learn about your process.
Customers
This section lists all of the customers who receive the outputs from the process. As noted in the Output section above, it can be used to define both the internal and external customers or to only show the end customers. The purpose of having this information is that you can tie the process outputs directly to the people who will be using them, and you can then identify the specific requirements that each customer has for the outputs.

I usually assign a letter to each customer. This number is added to each of the requirements in the next section so that I can easily identify which requirement comes from which customer(s).

Requirements
This category is optional on SIPOC documents, but I like to include it. It provides details about the level of quality, specifications, or acceptance criteria that customers want from the process outputs. This information can often be learned from collecting Voice of the Customer (VoC) information. Ideally, you will have specific measures and target values associated with each of the customer requirements so that expected performance can be measured and quantified.

Creating the SIPOC-R document
A project team of process or subject matter experts usually works together to develop the SIPOC-R document. During this time, it is helpful to have a completed process map available to guide the team through the process and ensure that steps are not overlooked. I usually have teams systematically look at each step in the process and identify the inputs, then the suppliers, the outputs from each step, and finally the customers and their requirements.

There are many SIPOC-R templates available, but they commonly look like the example diagram below. Sometimes you will see them with the process steps running from left to right below the columns.
A process map is great for showing you all of the steps in a process, the order in which they occur, and decision points; but sometimes you need to dig for more detail. Using the information that the SIPOC-R provides, project teams can identify opportunities for improving what flows into the process and ensure these inputs do not become the root causes for poor services. They can also use the information on the document to keep track of all of the outputs, who receives them, and the standards each must meet to be considered acceptable to the customer. This information can also be examined to determine if customers are asking for variations in the services being provided, or if they have conflicting acceptance standards, both of which place differing demands on a process and affect its overall performance. The next time you are looking at one of your services and trying to find a way to improve it, consider using the SIPOC-R to help add detail to your analysis. As always, I welcome your questions or comments. You can email me at clayton.taylor@asu.edu.

**About the author:**

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