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Lecture – 17 Process Mapping : SIPOC

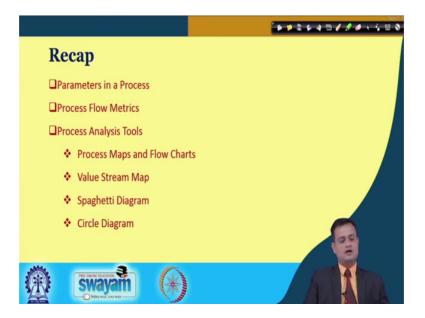
Hello friends I welcome you to lecture 17th Process Mapping SIPOC. So, we have already discussed about the importance of the processes in Six Sigma and we have talked about couple of aspects in the previous lecture.

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So, before we begin with this important session let us just try to appreciate one very famous quote from the Aristotle, Quality is not an act, it is a habit. So, you cannot say that I achieved a quality will remain forever, it is a habit you must keep repeating your practices and that is where it is important to document properly present my processes. So, that over a period of time quality comes in the blood of my people and they use it as a habit to execute various processes.

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So, let us try to have the small recap. We had seen the process parameters process flow matrices like cycle time, throughput time, take time, flow time and we have seen couple of process analysis tools like process maps and flowcharts, value stream map, spaghetti diagram, circle diagram. And we appreciated that this kind of approaches can really help to gain deeper insight into the process and document my processes for better understanding, imparting training to my people and transfer of knowledge.

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So, this lecture is dedicated to very important tool, we have discussed it little bit in the last lecture, but here we would try to see this particular approach called SIPOC in detail and we will see that what could be the application with some example. So, process components in SIPOC, mapping the process step to grow the SIPOC.

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So, what is SIPOC? As I mentioned that when you talk about quality of your product or service to the final customer value creation is taking place across the value chain or supply chain. And, you cannot simply say that controlling one particular process at the manufacturing end or maybe at the distribution end will really satisfy your customer.

So, quality in must be built into the product or services and for that it is necessary to gain the sufficient knowledge, control measures and evaluation of various steps in the value chain. So, SIPOC which stands for a high level view of process, it gives you the bird's eye view of the entire process and typically it stands for Supplier Input Process Step Output and the Customer.

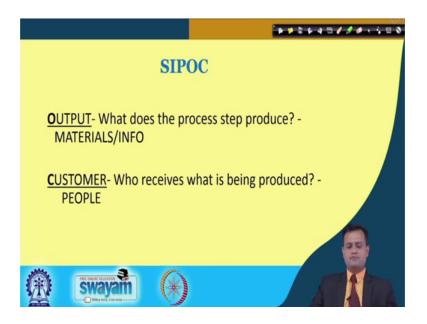
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So, you can see this various steps in the SIPOC and supplier we know is the person, organization that provides input to a process. Lot of research people have done in supplier relationship building, supplier evaluation, frameworks, supplier selection you can read a very good article Tough Love Toyota the approach they adopted for their suppliers. The article was published in Harvard business review and you can see that what is the importance of supplier, you can also see the practices adopted by Maruti for developing the suppliers and seeing that they really contribute towards the value creation in the manufacturing of the product.

You have the input resources that is added to a process by a supplier, you have the processes basically the transformation. Series of steps where an input converts to an output, you have the output resource that is the result of a process and then you have a customer it may be person, it may be organization that receives products and services.

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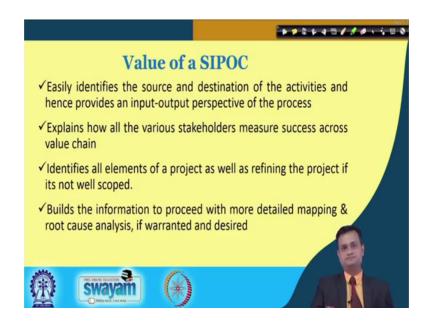
So, SIPOC basically output what does the process step was produce material or information. If you look at the service sector then many a times it is the information, customer who receives what is being produced that is the people.

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Supplier- where does the input for our process step come from? They are the people supplier. Input- what is the needed to what is being needed to complete the process step? And that is your materials and information.

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So, there is lot of value in developing the SIPOC in order to gain a good understanding of the value chain, supply chain as well as say problem areas that demands immediate attention of the management. So, easily identifies the sources and destination of the activities.

Where something begins, where something ends, who is the owner of this activity and for what measures this activity needs to be checked and whether these activities performing well or not that can even be evaluated. Explains how all the various stakeholders measure success across the value chain. This is very important say local optimization has no value, I cannot simply say that my product is not good just because my supplier is not giving the quality components.

I cannot say that my product delivery lead time is very high because my manufacturing processes are slow. What a customer finally, looking for is the final product and service which can create a value for him and it is important to see that all the stakeholders they must look at their ownership and contribution in the value chain and not that they should try to locally optimize on inventory information profit and other measures. Identifies all elements of a project as well as refining the project if it is not well scope and builds the information to proceed with more detailed mapping and root cause analysis as it is required.

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So, there are certain requirements in order to develop a SIPOC. So, clearly defined start and stop points, establish key process metrics, how a particular process will be evaluated and measured. Identify the components of a process and their owners, identify all the suppliers and their inputs to a process, identify all the customers and the output they receive, establish customer and all stakeholder requirements and how they measure the success.

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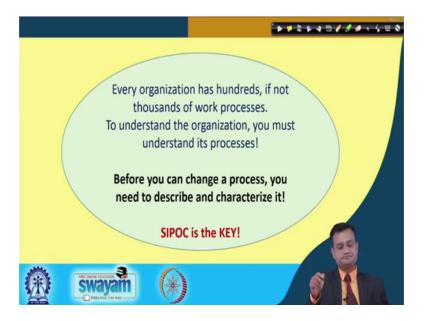


So, this is something that really can help us to create a logical well documented SIPOC which can be accepted by all the players across the value chain and they get sensitized about their responsibility.

The SIPOC: it is a key to analyze diverse processes and it may be scheduling production queuing customer service, I am just giving you the examples to motivate you that SIPOC is not just limited to one typical manufacturing setup. You can create a SIPOC for different-different kind of situations, it may be a queuing customer service repairing or maintaining a product it may be a billing process, preparing an annual report, transactional process, distributing mail, budgeting, entering order, answering telephones, communicating, coaching or teaching.

So, for all these you can create a SIPOC and very well you can see that how various steps in the value chain they are connected with each other and not only the connection how they are impact impacting the efficiency of each other. So, visualizing the process visualizing the connection and also understanding the impact one step can create on the other step really help the people to understand the importance of their processes.

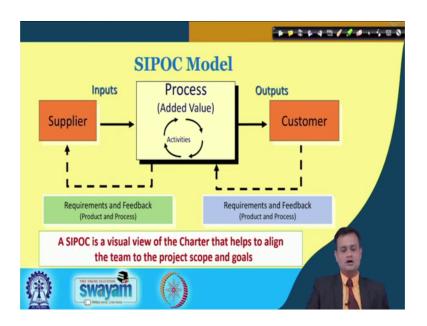
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So, here just see that every organization has hundreds, if not thousands work processes to understand the organization you must understand its process.

Very simple you apply to an organization or a person this holds good suppose I want to just the quality of a person just in one interaction I cannot judge. If I interact, if I see that person working in some task and if I observe this process fine I will have a fair judgment about the competency of that person same is the case if you want to evaluate the organization, their performance processes are the key and if you want to improve the processes, understand the processes SIPOC is the key.

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So, typically your SIPOC model looks like this, you have a supplier you have process has a central part value adding output customer, customer they gives the feedback. And this feedback helps to improve upon process steps, process steps they give the feedback to the supplier and further that helps the supplier to take necessary improvement actions.

So, this feedback loop keeps on going and typically a SIPOC is a visual view of the charter that helps to align the team to the project scope and goals. So, this is very important because without you can coordinate the efforts through the people through the some equipment machinery and setup you cannot really improve your processes.

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Let us see a small example and in this example you will see that it is typically say a generic example of pizza making. So, here if I have to develop a SIPOC supplier input process output and customer let us try to first focus on this particular say dimension that is the process.

So, I will have the process very simple, take orders make pizzas deliver orders and collect payment. So, only four steps are involved, now let us try to see that how we can tie up the various other elements of the SIPOC with this core process and what could be their relationships. So, let us just go left side one step and try to see that what is there here as the inputs. So, you have dough, cheese, raw material salami or sauces vegetables tomato paste you have equipments, ovens, boxes menus you have credit cards for processing the money transaction phone for communicate receiving the order and you have the space for say all initiating this manufacturing activity, these are typically your inputs.

If I just go one step beyond then I can see that I have supplier, now this supplier basically supplies me the dough's, cheese, meat, veggies, tomato, supplies, soda makers then equipment suppliers oven suppliers box maker printing payment system telecom system and land lord you have rental the space. If I just go downstream than I can say that yes I have the output that is walk in dinners, party house, corporate employees various kinds

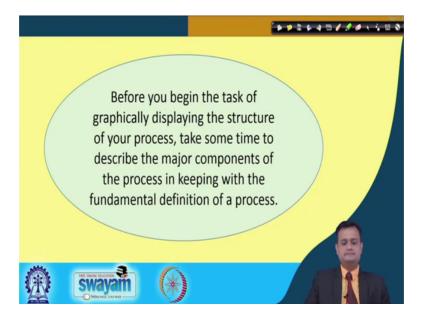
of events they can organize and finally, if I just go to let us say customer then I have pizza made to order soft drinks are predefined customized pizza combos and party packs.

Now, once you have this preliminary SIPOC available you can very well see that how each element is connected with each other, it means if I want to see the impact of one element on the other element I can easily connect. Now here this is just the preliminary view, but for each particular step and activity involved in each step you can set some reasonable KPIs measures to see that your processes are performing well. Suppose, you have some problem at the customer and then this kind of high and representation also helps you to have better traceability and you can take it out go upstream from the downstream and see that yes what could be the problem areas because of which customer could not really feel satisfied in receiving the product.

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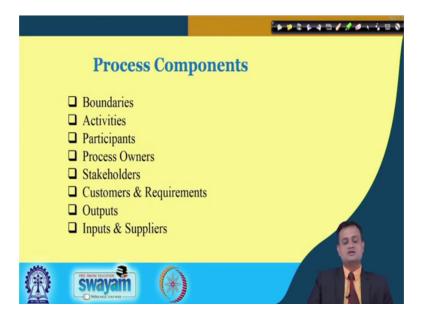


So, this particular representation is really helpful in making your flow process efficient. Now what are the process components? (Refer Slide Time: 15:15)



So, typically before you begin the task of graphically displaying the structure of your process take some time to describe the major components of the process in keeping with the fundamental definition of the process. So, this is the prerequisite preliminary thing that it must see together and do it so that the process elements can be well identified and described.

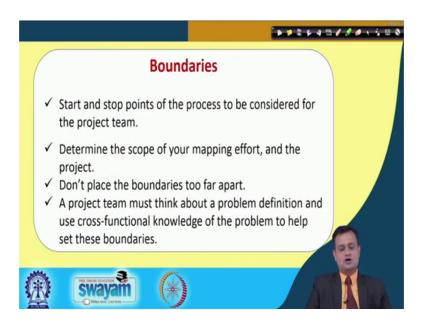
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So, there are process components like boundaries activities, participants, process owners, stakeholders, customers and the requirements outputs and inputs and supplies. So, these

are the various components of your processor that must be well defined if you really want to have a good SIPOC representation.

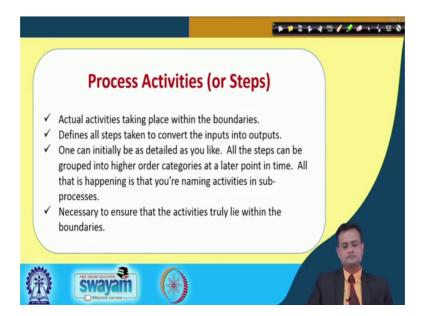
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So, I would just like to emphasize on couple of things boundaries that is basically start and stop point of the process to be considered for the project team. Determine the scope of your mapping effort to what extent you want do mop map and the project, you may not like to go to supplier's suppliers and up to that detail, minute detail. So, you just define fixed your scope do not place the boundaries too far apart. So, when you do it, it is difficult to see the interconnection and this much distance in the boundaries really create the chaos in the system in terms of ownership and the transformation of the flow of the material, flow of the information and the material.

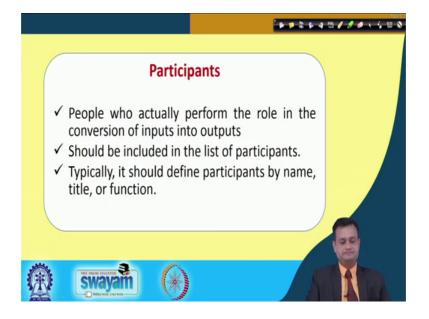
Project team must think about a problem definition and use cross functional knowledge of the problem to help visualize this boundaries. Because many a times you say from manufacturing point of view the boundary ends here, but it may not be so when it comes to warranty, when it comes to customer service when it comes to let us say inventory management or when it comes to scheduling the production. So, you have to figure out that what is the real boundary.

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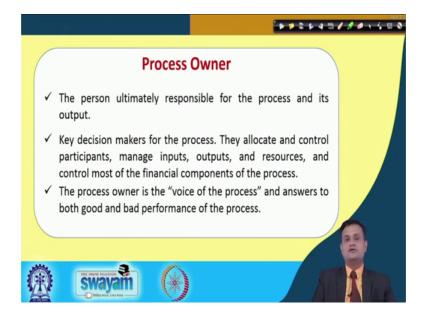
You have process activities or straps. So, actual activities taking place within the boundaries, define all steps taken to convert the inputs into the outputs, one can initially be as detailed as you like. All the steps can be grouped into higher order category and at a later point in time all that is happening that you are trying to name the activities in sub processes and necessary to ensure that the activities truly lie within the boundaries so that the ownership of the activity and the evaluation measures can be well defined.

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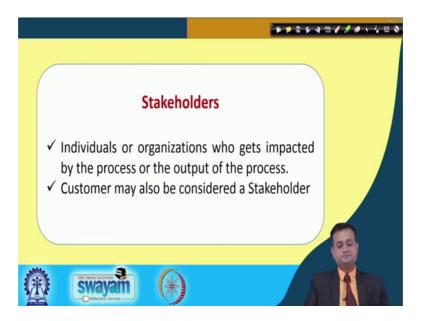
Participants they are the people who actually perform the role in the conversion of inputs into the outputs and should be included in the list of participants. Typically, it should define participants by name, title or function.

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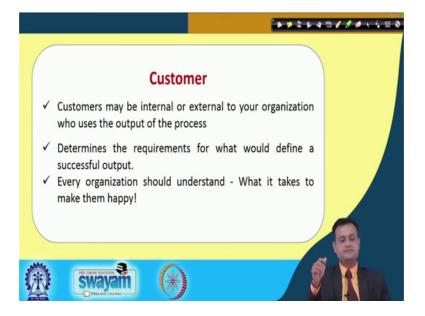
You have the process owner basically they take the responsibility of the process and the person who is ultimately responsible for the process is the process owner and also the output of the process. So, you have key decisions makers in the process they allocate and control participate say manage inputs, outputs, resources and that is where they try to see that processes can be handled efficiently.

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Stakeholders, individuals or organization who gets infected by the process or the output of the process in customer may also be considered as a stakeholder because they provide lot of input so, why to consider them as outside the boundary of my business they are important stakeholder.

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Customer they may be internal and external; always remember TQM says that you have internal customer and external customer if you want to really make your external

customer happy you must see that your internal customers they work efficiently, they take pride in their work and their work with very high moral.

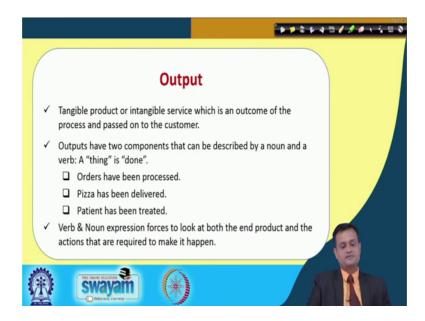
So, this determines the requirements for what would define a successful output and every organization should understand what it takes to make them happy whether it is internal or external.

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Requirements in a very simple way we have a lot of discussion on voice of customer and capturing customer requirement faster, better, cheaper the answer lies and I want all. So, caution: requirement should be specific and measurable.

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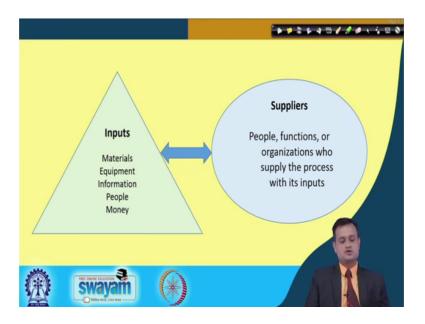


Output is tangible product or intangible service, sometimes when you visit the bank or restaurant or hospital and experience and intangible outcome that itself is a great outcome and in case of manufacturing you have a tangible product or outcome.

So, output have two components typically, you can classify, describe them by a noun and the verb. So, a thing and is done. So, couple of examples just I have put, orders have been processed. So, you can easily figure out what is saying and what is done. So, order is a thing and process is done. So, this is the noun verb relationship. Pizza is noun and delivered is verb, pizza has been delivered. Patient has been treated, patient is noun and treated is verb.

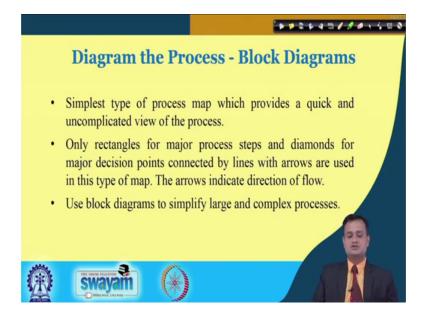
So, this verb and noun expression focus is basically and forces to look at both the end product and reaction that are required to make it happen. So, typically I will as a process owner get sensitized that in order to meet the final expectations of the customer what is the dynamics between noun and verb that I need to handle and if I can appreciate the importance of both noun and verb I can assure the delivery or the customer satisfaction say at the end very well in the process.

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So, input and suppliers you have different inputs as I mentioned material, equipment, information, people and money and you have the suppliers people, function, organization who supplies you the material through their processes.

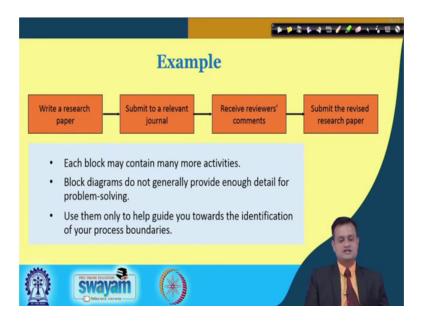
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So, diagram the process - block diagram it is a very important step in describing the process and it is a simplest type of process map which provides a quick and uncomplicated view of the process. We only use rectangles for major process steps and

diamonds for major decision points which are connected by the arrows and we also use arrow to indicate the flow of the material and information.

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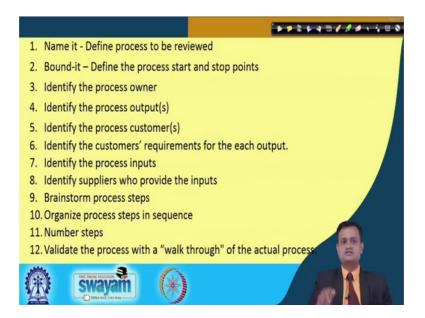
So, just see the example I want to write a research paper and the process is write a research paper, submit to a relevant journal, receive the reviewers comment and submit the revised research paper; so, it is a process. Now when I put it in the form of a block diagram I can understand the complexity involved and it stage and how much lead time each process will have in completing the entire process.

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Now, do you want to build SIPOC, I hope you all. So, this high level representation you can do it very easily if you follow some simple steps like this.

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Number 1 name it define processes to be reviewed, number 2 bound it - define the process start and stop points boundary; 3rd identify the process owner. So, this is very important you say that this process some somebody person x person y will look after. Identify the process output, identify the process customers, identify the customer requirements for each output. For each output I mentioning identify the process inputs, identify suppliers who provide the inputs brainstorm process trap. So, that you do not miss the intricacies involved in any of the step which is important in completing and executing the entire process.

Organized process steps in sequence, number the steps, validate the process with walkthrough of the actual process. Validate it your process whatever you have developed is on the paper go to the plant or the service you need you are studying and validated verify it so that you can have the document which is not missing any actual step involved in the process execution.

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Just see the example of completed SIPOC and the process description developing a data warehouse. So, we are taking up small-small cases to really give you the understanding in a more detailed and exploratory manner so that you can appreciate the concepts in terms of theory as well as in terms of application.

So, you have procure hardware as one of the process, procure software and develop data warehouses these are the steps involved. Now if you look at just you go little on the left side you have inputs that flat files project description, RFP goal, then requirements, project description, then RFP goals and again requirements. If you go to supplier end project manager, vendor, IT staff, source system, project manager, hardware vendor, again project manager, software vendor, IT consultant and source systems.

If you look at the output; data warehouse, data extracts, data say cubes, reports, infrastructure, customers, senior management, business owners, report consumers, senior IT management and it staff. Here I have not just described the SIPOC, the processes I have also included the matrix if you look at the matrix relevant to judge the performance at the input level time to load, tetra byte loaded, cost goals restrains then trying to load and tetra byte loaded.

You can see the matrix at the process level number of steps to be performed, number of automated steps, time to complete the process, time to complete the process and number of steps, number of automated steps and so on. And if you look at the output you have

data integrity, report usage, cost of package, cost of hardware, cost of maintenance data integrity, security issues, cost of staff and so on.

So, now with this high level representation you gain better inside into the process and when you measure the process against pre decided performance matrix you will also understand that in case of problem where to attack and what to handle in order to get back to the original performance of the process.

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So, this is maybe the completed SIPOC and you can have step one, two, three, four, five, six and this is just the template.

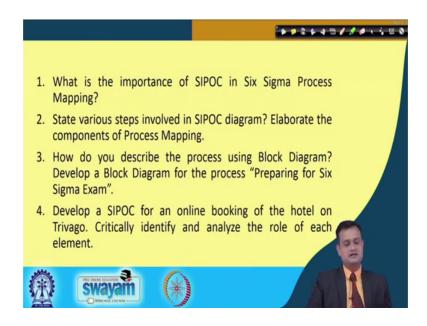
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rug Company	Medicines	Meet Patient	Medicine	Patient	
istributor	History File	2. Make Diagnosis	Dose	Administrator	
egulatory	Guidelines	3. Prescribe Medicine	Frequency	Health Authority	
gency	Regulations	4. Dispense Medicine	Recommendation	Drug Company	
Government	Internal	5. Update Patient	History File		
	Procedures	History	Payment Request		
	Training	6. Reorder Medicine	New Order		/

Another example SIPOC of prescribing medicine, here I will not put the matrices I am just leaving it to you as a homework, but just see that if you go to doctor and he has to prescribe the medicine then process includes meet patient, make diagnosis, prescribe medicine, dispenser medicine, update patient history, reorder medicine the complete transformation. Let us look at the input side, you need to have medicines, history file, guidelines, regulations, internal procedure, training and so on. If you look at the supplier you have a drug company, distributor, regulatory agency, government, output is medicine, dose, frequency, recommendation, history file, payment request, new order and you have a customer that is the patient, administrator, health authority and drug company.

So, many a times if you look at the list of the customer you do not have only patient as a customer when you consider a typical process like prescribed in medicine and representing it has a SIPOC you have many other agencies like administrator, health authority, drug company as your end customer. And this kind of representation can help you to understand and meet the requirement of various stakeholders. Before I begin as a usual practice I would like to float couple of questions for thinking and introspection.

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Number 1 what is the importance of SIPOC in Six Sigma process mapping? Six Sigma is all about reducing process variability and SIPOC is the key. State various steps involved in SIPOC diagram? Elaborate the components of process mapping.

Question 3; how do you describe the process using block diagram? Develop a block diagram for the process preparing for Six Sigma exam. So, you will be appearing for Six Sigma exam at the end of this course and right at this stage can you develop a good block diagram for executing your preparedness preparation and targeting the e x grade in this particular course. Develop a SIPOC for an online booking of the hotel on Trivago. So, today we have lot many online options available MakeMyTrip, Trivago and many others. So, I want to book a hotel on Trivago and can you develop a SIPOC critically identify and analyze the role of each element.

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So, you can go through couple of references where SIPOC is describe. Our lecture has covered in a more expensive manner and this should help you to visualize the SIPOC for different real life processes.

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So, as a conclusion SIPOC is an effective way to get deeper insights into the processes and their implications. A detail representation of SIPOC typically helps the process owners to be more critical about their matrices and have a better control over the process. So, with this we are ending our session on SIPOC.

Thank you very much keep revising, revisiting the concepts that will help you to understand how we are advancing in our DMAIC D M A I C journey of Six Sigma and also it will help you to see the interconnectedness of the topic. So, we will meet again with the new topic in the next lecture till the time enjoy, be with me.