System Design for Sustainability
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Week - 6
Lecture – 2
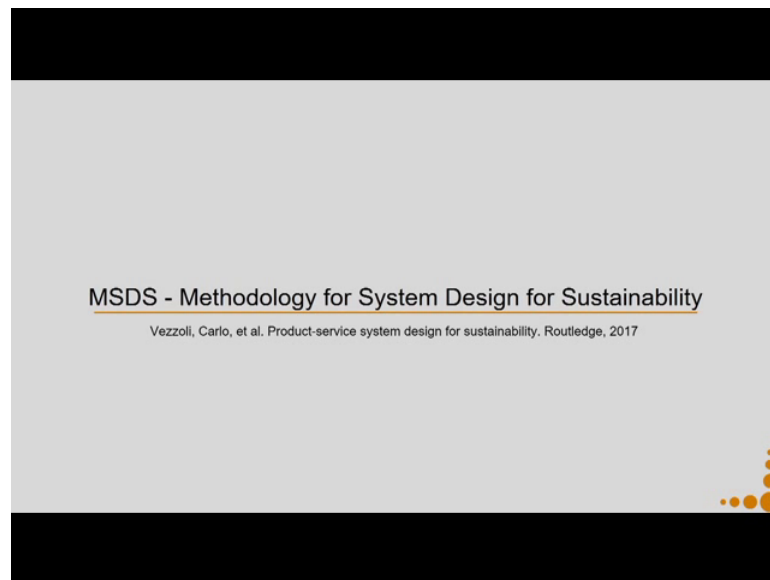**Sustainable Product-Service System Design – Methods and Tools**
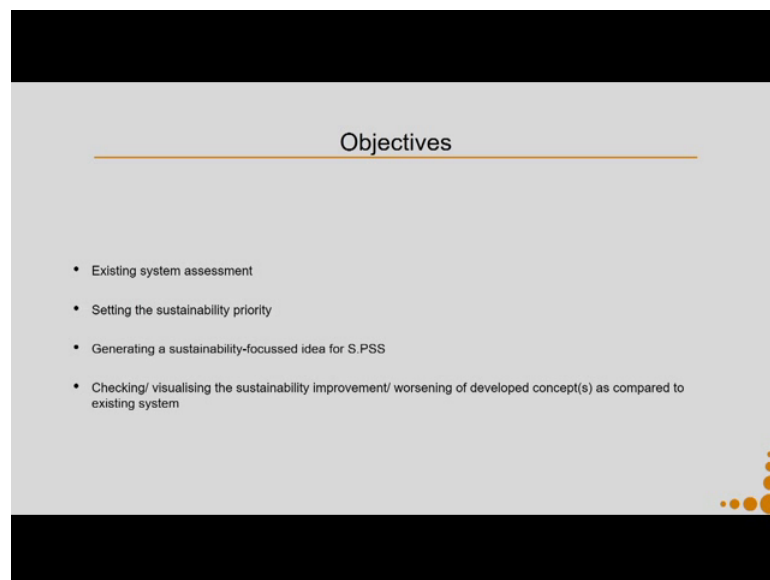
Welcome to today's lecture.

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So, today we will be discussing on certain methods and tools for Design for Sustainable Product Service Systems.

So, the methodology that we will talk about is called as MSDS standing for Methodology for System Design for Sustainability.

So, the objectives here is first we want to do an existing system assessment. So, the process starts with understanding the current system. As a result of this understanding, what we can do is setting the sustainability priority for the given context.

Thereafter we start generating sustainability focused ideas for the SPSS. And finally, for each of the ideas generated we will do a check or visualization of the sustainability improvement or worsening or develop concepts as compared to existing system.

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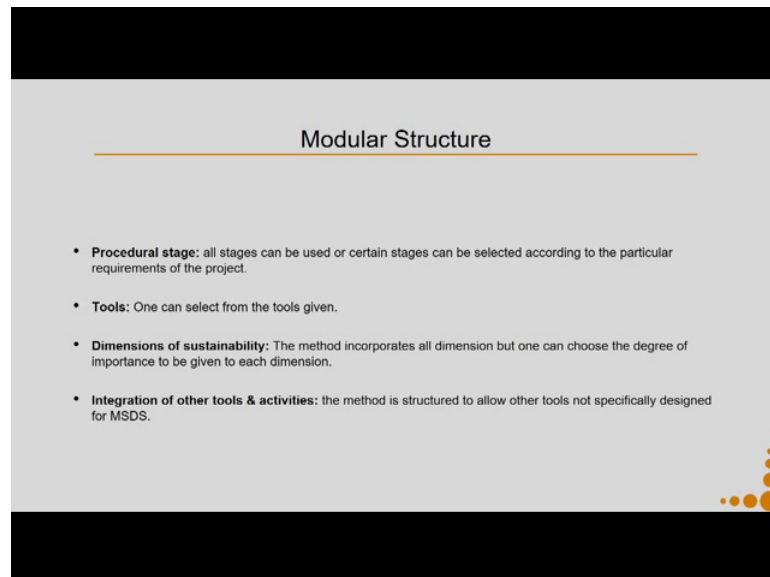
MSDS method is a modular structure, why is it so, it consists of certain procedures. Depending on the context depending on the project depending on the resources, one can go through all the stages or one can select some of the stages. So, that is the modularity 1, it consist of many different tools it consist of 3 dimensions of sustainability, but one can set varying degree of importance to each and every dimension.

You can also choose to give low priority, no priority, medium priority and high priority. With the tools the method already has certain tools you can use those tools, you can use all of those tools, you can use some of those tools, you can also integrate other tools, which have not specifically been designed for the MSDS method also depending on the context.
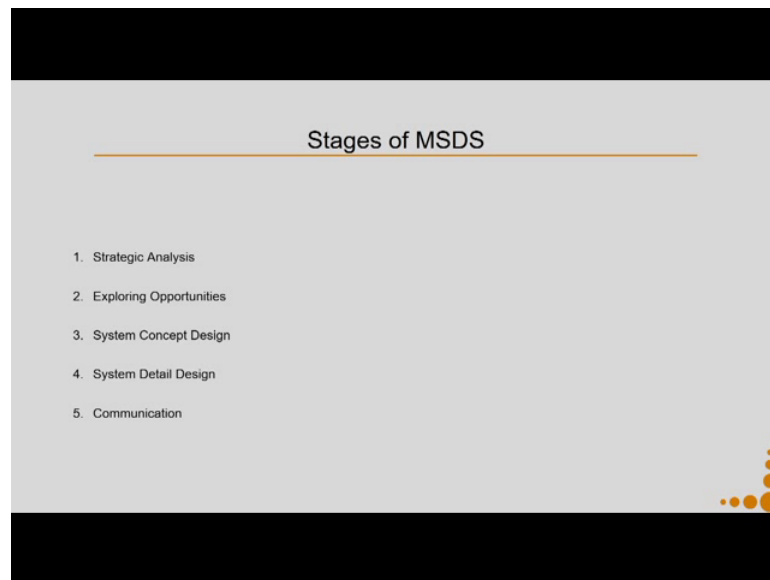
So, coming to the stages of this MSDS method so, the first stage is because we want to understand the existing systems. So, the first stage is strategic analysis. The second stage is when we try to generate ideas. So, which is called as the exploring opportunities, then we combine all the ideas that we explored in step 2 to design system concepts. Once our system concepts are ready, we will do the detail design of the system concepts and therein we will communicate our design, we will communicate the sustainability improvement or worsening of the situation.
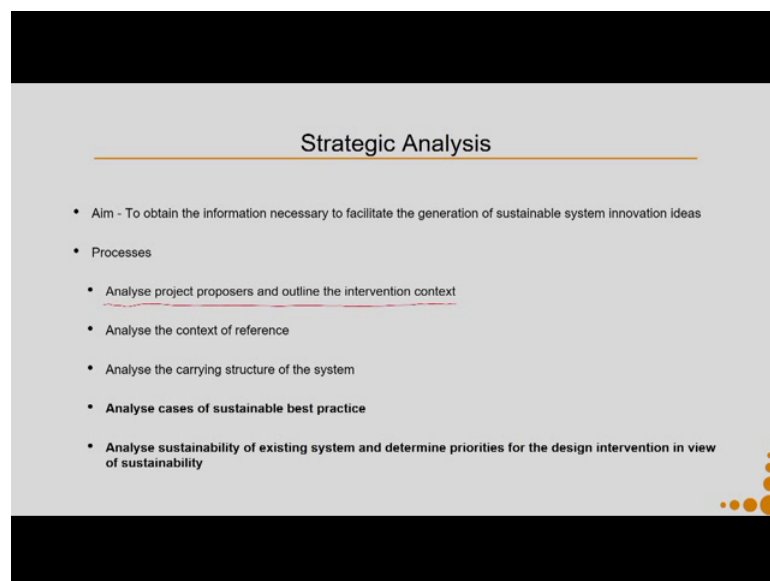
So, let us start with how to do strategic analysis? So, the aim of strategic analysis is to obtain the necessary information, which will facilitate the generation of sustainable system innovation ideas. So, it consists of this particular stage consists of certain processes and sub processes. So, the first process is analyze the project proposals. So, who are the ones who are proposing the project?

So, these might be companies, these might be NGOs, this might be a government, this might be a local body and so on. So, analyze the project proposals we need to understand them and outline the intervention context, where do you need to do your design intervention analyze the context of reference. So, as we already discussed that sustainability is not an absolute concept, it is with respect to something, with respect to the existing situation.

Also different context we can achieve sustainability only to different degrees. Hence, the requirement to understand the context of reference, the third process here is analyze the carrying structure of the system, what it means is the particular system? What all it can carry in terms of technology in terms of social norms, in terms of governmental rules and regulations in terms of economy. Then the sustainability orienting stages the sustainability orienting processes of the stage are analyze cases of sustainable best practice. So, in the given context of reference I can try to find out cases of sustainable best practices.

Not always those cases will be available in case such cases are available I will try to identify them and try to see how they have achieve sustainability? And, then analyze sustainability of the existing system, because we also have an existing system. So, we will use certain parameters, we call them as sustainability and design orientation SDO. So, there is an SDO tool kit. So, we will use the tool kit to analyze the sustainability of the existing system and then determine the priorities for the design intervention in view of sustainability.
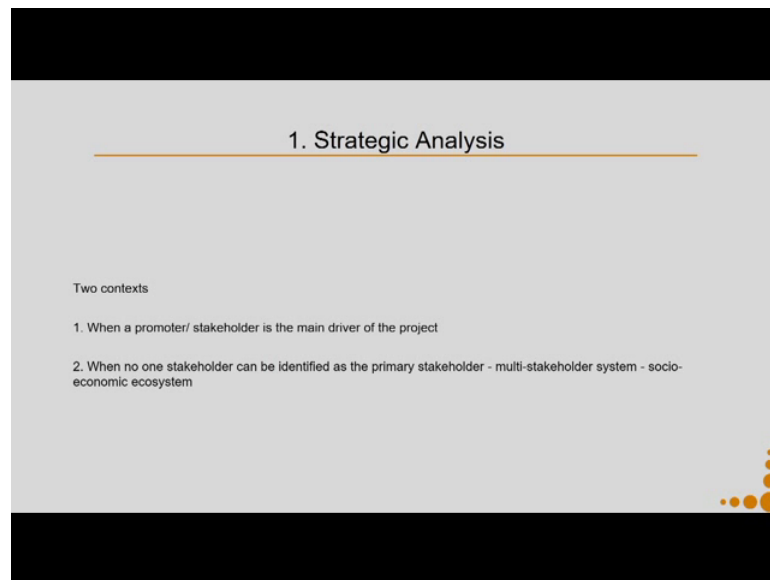
So, in first strategic analysis as I told you in the previous slide, the first process is analyze project proposals and outline the intervention context, the first process. Now, in order to do this particular first process I need to understand my project proposals. So, we found that there can be 2 context for this particular project proposals. So, the context one is when there is a project proposal, who can be a promoter or a stakeholder, who is a main driver of the project?
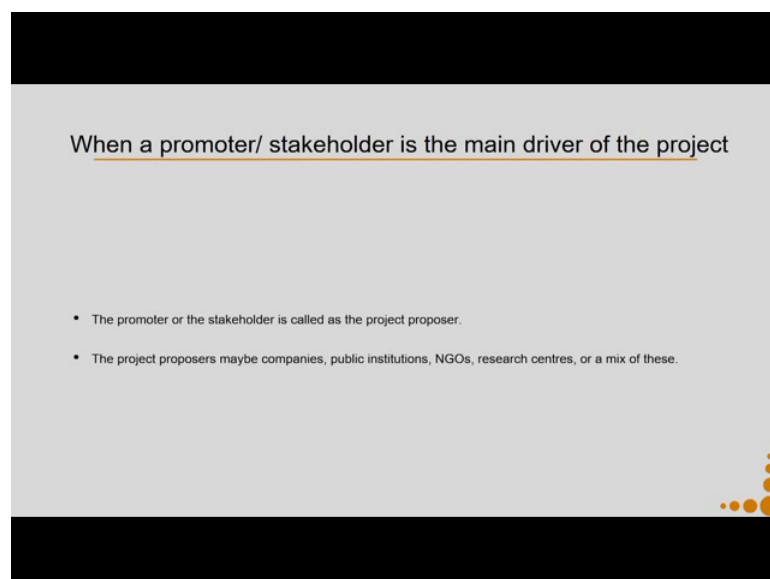
So, this particular agency which can be companies public institutions NGO's research center or a mix of all these. So, we can identify one of them, who is the main driver of the project? So, that is my context one of strategic analysis. Context 2 is when there is no one stakeholder, who can be identified as a primary stakeholder? Is a multi-stakeholder system, what we call them as socioeconomic ecosystem? Say for example, of the craft sector in the country or the handloom sector in the country or say the agricultural sector. So, this kind of system the multi stakeholder system, you can find in the craft sector of the country or say the handloom sector or the agricultural sector.

So, then this is very difficult to identify who is the primary stakeholder? Because, the stakeholders are very distributed they are too many in number they might not be organized. We will try to understand the second context more in depth with examples in the next week. Today, what we will do is the first context which is a promoter stakeholder who is the main driver of the project. These kind of situations you will identify mostly in our urban way of living or urban way of consuming or something which we call as the developed context.

So, the promoter or the stakeholder is called as the project proposer. The project proposer may be companies public institutions NGOs research centers or a mix of all of these. So, it does not mean the project proposer in this case has to be one person or one organization, it can be multiple organizations, but there is a difference. Let us see an example to identify what is the kind of difference from the multi stakeholder system.

So, let us consider a hypothetical company called fresh, fresh makes water purifiers using UV and RO technology. These machines are sold to domestic customers all over India. The company has approached you to explore if they can venture into sustainable product service system solution and expand their market reach.

Why I am saying expand their market reach, because if you remember the sustainable PSS definition, it always said being socially sustainable, environmentally sustainable, in a way that it is in the economic interest of the stakeholders. Now, in this particular context fresh is a company. Say, this would have also been like municipality from a particular city approaches you, saying that I want to do something about giving a product service a sustainable product service system, in the domain of providing safe drinking water to the residents of my city. That is also a context of this particular situation, because here I can identify government is the main stakeholder.

The government is not involved in purification of water the government might give the tender to certain other companies, who will get involved into purification of water treatment and so on, but I still have a primary stakeholder the government. It can be also an NGO, who comes up and says that, I want to design avenues in which I can provide safe drinking water to lower income people living in the slums of the city.

And still we are in the same particular category, because I can identify that NGO is the main body, who will actually anchor the whole event. This NGO will anchor the activity

of design the NGO has a vision the NGO will bring in onboard the companies who will be required to produce the water purifier or the water purifying system and so on. So, let us take an overview of the process in strategic analysis.

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So, the first process in this strategic analysis is project promoter analysis and definition of intervention context. What, we do over here is 2 things, defining scope of the design intervention which is basically a document specifying scope of intervention and design brief. Why we try to do this? Most of the time the initial design brief will come from my this main stakeholder. So, either fresh can give me a design brief or the NGO or the municipality can come up with this particular design brief.

Then I will try to understand, what is the scope of the intervention? So, fresh with say I am a company in the domestic segment people know me in the domestic segment. So, I want to enter into the same with my new solution I want to enter into the same category. The domestic water drinking water supply, I want to do the whole work with certain amount of budget. I want to do the whole work with certain time frame the certain amount of human resources. So, this is the defining the scope of the design intervention, I might I am with importing certain components from outside the country, I have the licenses to do this or I will procure the license I am in a position to do this. So, in defining scope of design intervention all these aspects can be either already given by the company or you can question the proposers and get the knowledge.

The next sub processes project promoter analysis. So, from the first co the scope of design intervention, now you can see that my scope for design intervention is registered as first and the project promoter analysis is registered as second. Although, these are mentioned in a sequence, but there are times when we cannot do them in the exact sequence. There are also times when I have done the first one, and while doing the second one I come up with new points which can be added to the first one. These are all perfectly point to go ahead with you will see by the end of the process of strategic analysis, my initial scope of design intervention the definition would have changed a lot.

So, my second process is project promoter analysis. What I try to do is summary of the project promoter analysis? Like, what is the machine of the company or the NGO or the government body or whoever is the project promoter? What are their main expertise and say for example, if the municipality wants to offer safe drinking water, there might be some municipalities who already have facilities which do water treatment. There might be other municipalities which are right now do not have that expertise.

So, they would they might either have to develop or department in their own municipality or otherwise they will have to give a contract to somebody who is outside. So, understanding the main expertise is very important. Say for example, the company just does not have an any experience in dealing with the industrial market or the commercial market. And, you want to come up with a solution which is like a in between domestic and can be also applied to certain commercial context. So, in that case the company will have to develop expertise in that particular context, when they should be ready to invest their time effort and money in that direction.

Then we do a SWOT analysis which is an analysis of the strengths weaknesses opportunities and threats. We also do a value chain analysis like who all are the existing suppliers of the company, who all are the existing distributers of the company? How does the company provide maintenance to it is consumers? How does the company reach the information to it is customers that this kind of a product is available.

So, the advertisement part of it. So, all the value chain everybody who is involved in the process of making that existing product available to the market. So, the tools that we use are preparatory company questionnaire mini document in which I will be documenting

everything on the SWOT matrix and the systems map so, the key questions. So, again let us. So, my aim here is project promoter analysis and definition of intervention context.

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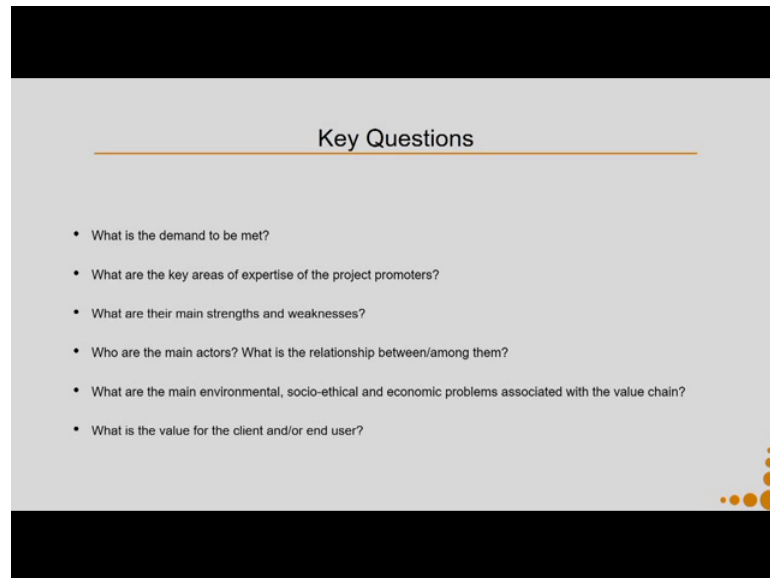
So, what are the key questions that I will be asking over here are why do I tell you about these key questions is I will also give you what the preparatory questionnaire is, but there might be times when you need to tweak it. In order to be able to tweak it you need to know what are the basic questions, what I am what am I trying to do in this particular context. The key questions over here is what is the demand to be met, is the demand about safe drinking water, is the demand about clean water, there can be a difference between safe drinking water and clean water, or is the demand about mineral water, is the demand about water from glacier or water from a spring. So, what is the demand which is to be met, both in terms of the quality as well as the quantity?

So, quantity here might name 1 million liters of water per day. What are the key areas of expertise of the project promoters? What are their main strengths and weaknesses? Who are the main actors? What is the relationship between or among them? So, say for example, so, a fresh is only involved in purification of water, but the it does not own the bottling plant, the bottling plant is owned by someone some other company.

So, in this case in order to reach this bottle water which fresh has fresh might have to. So, the 2 main actors in this case is the bottling company and fresh say fresh is as in our context is about making water purifiers. Say the RO technology and the UV technology

is not owned by fresh. They are owned by some other company and even on lease to fresh. So, I have 2 main actors over here the company who lease the puri RO technology and UV technology to fresh and fresh in itself. Fresh might be also getting the um service engineers trained somewhere, either they have it in house or they might have given it to another company.

So, in that case another main actor comes in. So, we have to identify who all are the main actors there might be many smaller actors also. Why I am not considering the smaller actor say for example, there is a small actor who is the one who provide the nuts and bolts in the water purifier. Now, because that is not a very specialized item I can easily switch from current actor current supplier to another one.

So, not much of a problem, hence in this case I want to identify who are the main actors switching away from home it might be very difficult and it might disrupt my whole ecosystem and what is the relationship between or amongst them? What are the main environmental, socio-ethical and economical problems associated with the value chain? What is the value for the client and or the end user?

So, is it the value is about high quality. So, do a as a customer do I know fresh water purifier to be a water purifier, which is long lasting, which is very trust worthy whose service is very good. So, one phone call and in the next hour the serviceman is at my doorsteps and repairs the machine within an hour's time. So, what is the value for the client which is the most important existing values? So, let us take each of these tools and see how we implement these tools in light of the key questions.

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Overview of Processes in Strategic Analysis

Process	Sub-process	Result	Tools
Project promoter analysis and definition of intervention context	Defining scope of design intervention	Document specifying scope of intervention and design brief	
	Project promoter analysis	Summary of project promoter analysis: - Mission - Main expertise - SWOT - Value chain (actors, structure, etc.)	Preparatory company questionnaire miniDOC SWOT matrix System Map

So, the first tool that we will go through is the preparatory company questionnaire.

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Preparatory Questionnaire

- What are the current problems of the company? What motives for innovation does the company have? Do changes in the company, market or society ask for innovation and a new strategy?

The following kind of problems may be starting point for the wish to innovate: eg. lack of new product ideas, impossibility of continuing to innovate in the usual way, restricting regulation (environmental, social etc) asks for new innovation ideas, loss of market share, too many competitors make a new kind of innovation necessary, too small profit margin requires new kinds of innovation, very small market penetration, lack of client loyalty, loss of social acceptance of product.

- Does the company have this kind of problem, or other problems?

Source: MEPSS Research Project. (2001-04). "MEPSS - Webtool (Worksheet W02 - Preparatory company questionnaire)." Retrieved 13 June 2017, from http://www.mepss.nl/index.php?p=tool&l4=W02.

So, this questionnaire you are suppose to prepare it and go and speak to different stakeholders in your project proposers company or the project proposer if it is an NGO different people who are the main people, who are going to handle it and I go and ask them these questions.

So, my first questions are what are the current problems of the company? What motive motives for innovation does the company have? Do changes in the company market or society asked for innotion innovation and a new strategy?

Say for example, I ask this question to fresh what are the current problems of the company? So, they might say that we because we make water purifiers with RO and UV system there are lot of other competitors in the market and there is not much difference between my product and others product in terms of technology. So, I see a big threat to my companies market size, I have to compete a lot in terms of the price at which I am selling my water purifiers. So, what motives for innovation does the company have? So, say fresh says that or do changes in the company market or society ask innovation and new strategy.

Say fresh says that because I have a RO based purifier a lot of the water is waste in a wasted and that water is suitable for no particular use it is suppose to be drain out only because it is it has lot of undesirable chemicals into it in very high concentration. So, I am seeing that the in light of all the environmental developments which is happening, the government might come up with regulation that such kind of wastage of water is no longer allowed.

So, that is a big risk that I am seeing to my current business. So, what can I do so, that that risk can be optimized or say for example, people are getting conscious about the fact that a lot of water is being wasted. And, now a days water supply in their municipality is being metered and they are paying per unit of water consumption.
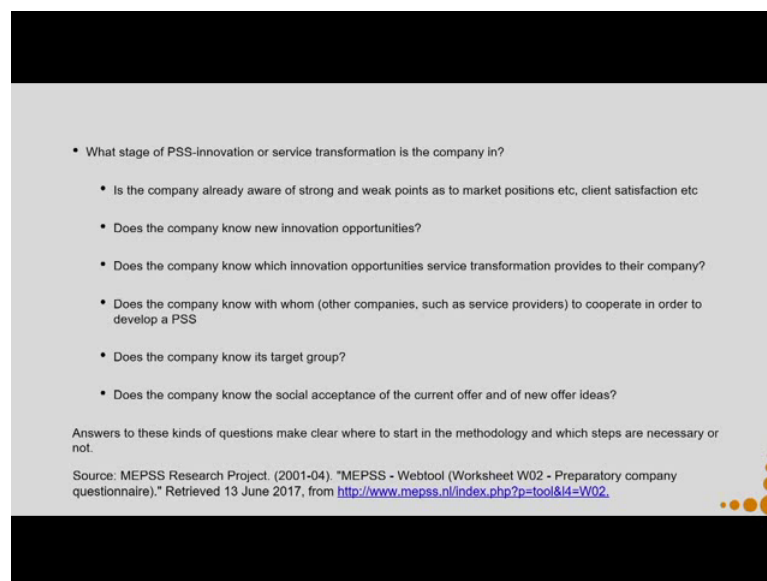
So, there is a potential risk that I see in my water purifier. So, what this question helps you to identify is the falling kind of problems may be the starting point for the wish to innovate? Like lack of new product ideas, impossibility of continuing to innovate in the usual way, restricting regulations like environmental, social, etcetera asked for new innovation idea. So, say for example, the government said I will not allow you to um sell RO dispensers which waste thirty percent of the water, too many competitors making a new kind of innovation necessary, too small profit margin requires new kind of innovation very small market penetration.

My RO and UV dis water purifiers are expensive they also require running water. Now, say a large part of the market does not have running water a large part of the market

cannot afford this kind of a product. So, I have a very small market penetration. Lack of client loyalty loss of social acceptance of the product, then my next question is does the company have this kind of problem so, other problem. So, say for example, I want to identify this problem which I mentioned you in the paragraph ago in that. Say most likely with your first question the company they will be able to identify many of these problems.

In case they are not you can also give this particular paragraph the problems may mentioned in this particular paragraph as use to your the person whom you are talking to identify of (Refer Time: 22:41) thing this is the particular problem that your company has or you have something which is similar to this, but different in nature how does that problem come up? So, the company should explain the starting point for the ways to innovate and to develop a PSS.

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Then, what stage of PSS innovation or service transformation is the company in? You need to also understand, whether they have any experience with PSS, because this one is water purifier selling company fresh, they will of course, have a product which is a water purifier. And, they will also have their service system, because the water purifiers constantly need servicing, they need maintenance certain parts like certain parts of the purifier need to be constantly changed every year or every 6 months. If it is an RO based system then a service engineer needs to go to a particular. Household checks the water

quality, the total dissolved solids and then tweak them purifiers parameters. So, that it can bring down, the total dissolved solids to the acceptable levels.

So, they will have a product plus service combination. So, you have to understand at what stage of PSS innovation or service transformation is the company in what is their experience? So, is the company already aware of strong and weak points as to market position etcetera client satisfaction etcetera, does their service engineers bring them these information. Does their do they have customer service centers, who bring them these information? Does the company know new innovation opportunities which already existing? Does the company know which innovation opportunity service transformation provides to their company?

Say for the machine is going to breakdown. So, the sensors in the machine automatically detect that the machine is going to break down and a call has sent to the service engineer. So, before your machine breaks down you can get the machine repaired. Does the company know with whom, like other company such as service providers to cooperate in order to develop a PSS.

Say for example, I want to have a call center, because I need to have these service people available online on call who can take a booking for servicing, should I set up my own call center or should I take the services from an established call center on the pay basis of number of employees that I engage for my activity, that will be a lower cost solution may be. Does the company know it is target group? No in the sense, what are their demands? What are their expectations? What are their needs? What is their way lifestyle? What is how much do they want to consume? How much they are willing to pay? What are the modalities in which they would like to do all these activities knowledge about all these aspects?

Does the company know the social acceptance of the current offer and of new offer ideas? So, say for example, earlier when water purifiers used to be based out of nearly charcoal based purifying candle, charcoal based purifying candle the social acceptance was of that kind of a water purifier. As soon as the next level of technology came in say the UV treatment based water purifiers came into the market. People started seeing that the candle based purifiers from which they already had were not good enough. The social

idea regarding it changed. So, everybody wanted to a UV wanted a UV based purifier, because the assumption was it is more healthier for me, it is safer for me.

As soon as the RO based purifiers came in again the same thing happened with the UV ma based purifier also. So, does the company know the social acceptance of the current offer and of new offer idea. Say for example, I might be come hearing from in the market there is some new technology x which might be much better. So, I might be looking to shift to that technology x. So, answer to these kinds of questions may clear where to start in the methodology and which steps are necessary or not.

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Then I asked what need for information or knowledge on sustainable PSS innovation and service transformation does the company have. So, you need information as well as knowledge. So, for people inside the company, they need to if they have to do sustainable PSS innovation and service transformation, they should first know what it is that is they should get the information this is important this is how it can bring them benefit? And, then how to do it they need the knowledge? So, does the company know how to communicate PSS innovation? So, if the company is doing an s PSS it has to also communicate to it is users only then the offer becomes very lucrative for the users.

Does the does the company know how to improve customer acceptance of the new offer? Does the company know how to access the environmental impact of the offer? Does the company know rule of thumbs for market success? So, answers to these kind of

questions may clear which elements of methodology and theory are required what kind of resources will be required for the company to make the switch.

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- What are the company conditions (in terms of time and money) and requirements for the innovation process?
- Identification of relevant issues like:

Regulations.   Property issues.   Involvement of potential clients partners, NGO's, other stakeholders

Finding the right market segment.   Expanding the market share.   Finding promising markets

Exploring customer needs

Source: MEPSS Research Project. (2001-04). "MEPSS - Webtool (Worksheet W02 - Preparatory company questionnaire)." Retrieved 13 June 2017, from http://www.mepss.nl/index.php?p=tool&l4=W02.

Then, what are the company conditions in terms of time and money and requirement for the innovation process. After, this we try to identify relevant issues like rules and regulations in that particular market. So, safe drinking water might be having certain rules and regulations, which needs to be fit. So, say for example, there is a limit of what is the safe limit for total dissolved solids in your water. If, you reduce the amount of total dissolved solids in water, the consumer start complaining that the taste of water has changed. So, there are regulations and there might be also consumer preferences. So, what are those in that particular area?

Property issues, which might be intellectual property rights, commercial property rights, trademarks and so on involvement of potential clients partners NGOs and other stakeholders, if there is a possibility how it is and so on. Then, finding the right market segment not necessarily the market segment that they are targeting at this moment is the right one, but there might be also certain potential market segments which are similar to their current market segment.

So, identification on those issues, then how to expand the market share, which means the like fresh there might be 3 or 4 more other companies. So, how market share is something like, how much of the market does a company x has in it is portfolio? So, if

the whole market size is 100 and fresh has it is product in 20 households, then it is market share is 20 percent. If, fresh had 9 out of this 190 of the household had it is water purifiers then the market share of fresh would be 90 percent. Then, identification of promising markets of course, fresh is in that business. So, they will have a good idea about that and exploring customer's needs.
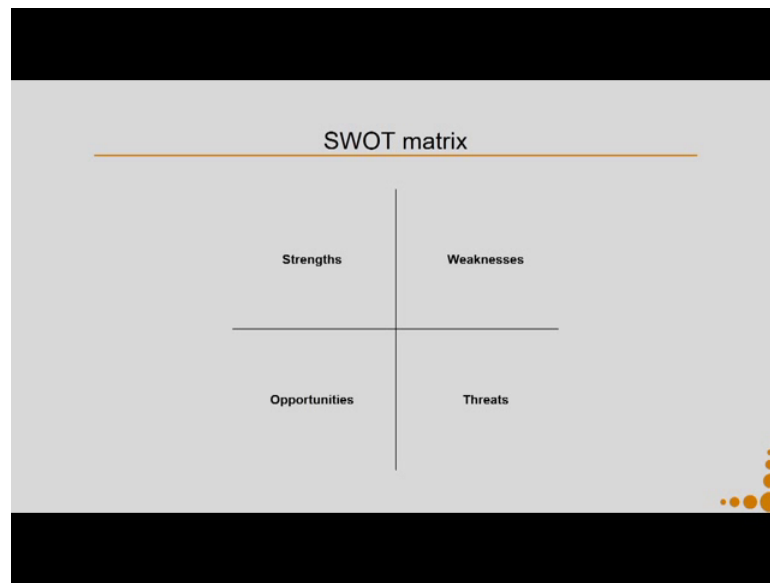
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Now, coming to the next tool which is the SWOT matrix; so, a SWOT matrix. So, once the company preparatory questioner has been answered by the company may appropriate people in a company or NGO or whoever in the project proposer in a level what we try to do is a SWOT analysis?

So, S Stands for Strength, W for Weaknesses, O for Opportunities and T for Threats. So, from the answers that you obtained from the preparatory questionnaire, you prepare a SWOT matrix. At times it might be also situation that the company is not able to provide you adequate information through the preparatory questionnaire. In that case and even if adequate information is provided it is still a better idea, that you do a literature research, which can be various internet resources library resources and so on.

To identify more aspects, which you can classify as strengths, weaknesses, opportunities and threats, going through statistical documents can be very important over here, to identify opportunities as well as threats. Once this part is done our last tool for this particular process is called as systems map.
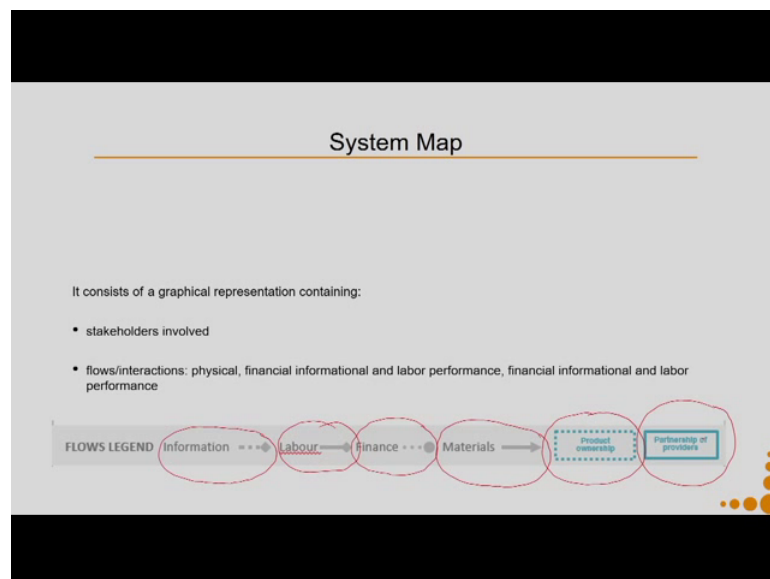
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So, let us see what is a systems map?

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So, a systems map is a graphical representation containing all the stakeholders involved. So, say for example, in my case fresh is a stakeholder, the company from which they have licensed the tech RO technology and the UV technology is another stakeholder, the supplier of the nuts and bolts or other components can be my, other stakeholders the distributers, the retailers, the consumer is also a stakeholder.

So, a system map is a graphical representation, which consist of all stakeholders involved, there might be certain very minor stakeholders and if they are extremely minor be night reject them to be put in a systems map, but it is better as far as we can as exhaustive we can be better a systems map.

The, second thing is it consist of flows or interaction. So, how do the stakeholders interact with each other or what flows between those stakeholder? So, what can flow with between these stakeholders either you can have information flow. So, fresh advertises to the consumers, that I have this very unique and very good water purifier that is like an information sent. So, if I take fresh as a stakeholder I will have information first being passed on from in terms of advertisement from the from fresh to my customer. Another one is another thing which can flow between 2 stakeholders is labor.

So, fresh as a company is a stakeholder and it might be hiring and agency which is another stakeholder, who does servicing for fresh? So, in this case what this agency service providing agency is giving fresh is labor. So, labor is flowing between them. Then, comes finance. So, because labor is coming from this agency to fresh, what fresh will give in return is some kind of money to agency to this agency. So, there is a finance flow. Say fresh gives it is purifier to the consumer. So, which means material flows from fresh to the consumer? In return what the consumer will do consumer will give money for buying that particular water purifier. So, finance flows from the consumer to the to fresh, this is the representation for product ownership.

So, in the current model we always buy the water purifier. So, the product ownership is with the consumer. So, this particular dotted line box shows, who owns the product in the whole system not necessarily the consumer has to own it. Say for example, we can also de develop a sustainable PSS in which the product is still owned by fresh and partnership of providers. So, in our model we will have 2 types of stakeholders; stakeholders who are providers and stakeholders who are consumers.

So, this last box tries to tell you who all are the providers, because of the partnership. So, in this case fresh the agency which provides service say the a technology, agency, which give license the technology the component producers and so on there all the they together form the partnership of providers.
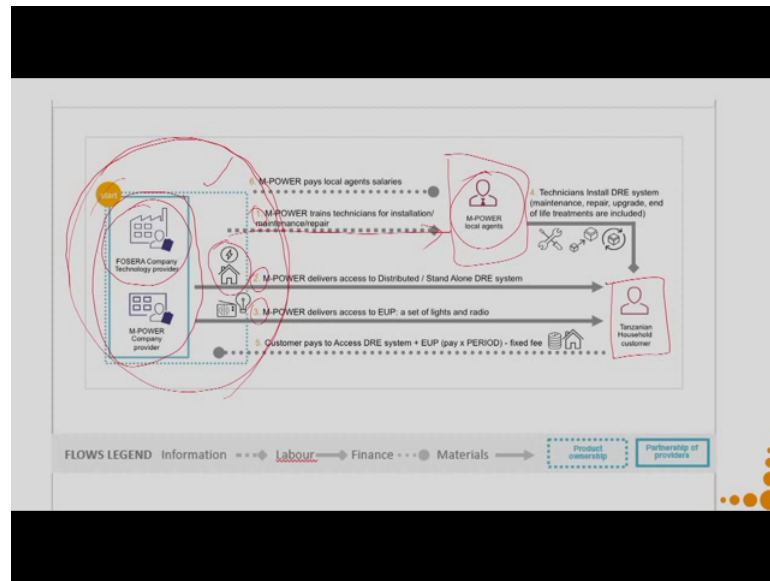
So, when I draw a particular systems map, this is how it looks like I try to identify different kinds of stakeholders? So, these are my stakeholders, then I try to identify the kind of flows which happens between then and I write down what kind of flows it happens I also number them. So, you can see the numbers 1 2 3 4 to show the sequence in which the flows are happening.

In this particular case my product, because of this dotted line I know that my product is owned by this group of stakeholders and the partnership of providers. So, the part although these are the this is a full group, which is the owner of the product, the partnership of providers is only this much. My ownership of the product could also be somewhere over here could also be somewhere over here it depends from system to system.

So, how do we make a systems map? So, in order to make a systems map first we create a boundary, which is my offer boundary. So, what am I going to offer? So, in this particular current fresh this is the current systems map. How fresh is operating right now? So, what is their offer boundary, their offer boundary is they offer a water purifier, they offer services whenever there is a breakdown happening and they also do a yearly servicing of certain components. So, they replace the components whichever is required. So, that is their offer boundary.

It could have been a different offer boundary also say for example, the offer boundary could have been also like at the end of life, I collect back the product from you I offer you a discount from my newer version of product, that could be also an offer boundary. The offer boundary could also be say for example, I install water purifiers at the building level and then I give a drinking water connection to every home. And I serviced this water purifier and the drinking water connection, whenever required that can be also my offer boundary. So, that is my offer boundary.

Now, another one is my system boundary, which is little bigger than my offer boundary. So, my entire system is about say for example, here I define by system is about clean drinking water for domestic use, wherein my water is being supplied by the raw water is being supplied by the municipality or the raw water is coming from a bore well.

So, in my system boundary I put in all those other components also which are required for this offer to work. So, the offer does not work in case I do not have a water supply from the municipality or from bore well or whatever. The offer also does not work if it do not have electricity from the main grids. So, the offer boundary is what the company gives you and system boundary is all other aspects, which are required in order to get the whole product running.

So, in my offer boundary I have my main stakeholders, who are together giving me that offer and in the system boundary I have secondary stakeholder. So, say if municipality provides you the raw water source, then the municipal water purification system is the secondary stakeholder. The ill mains electricity grid producer is your secondary stakeholder then what we try to do is identify all my stakeholders, in the offer boundary as well as in the system boundary.

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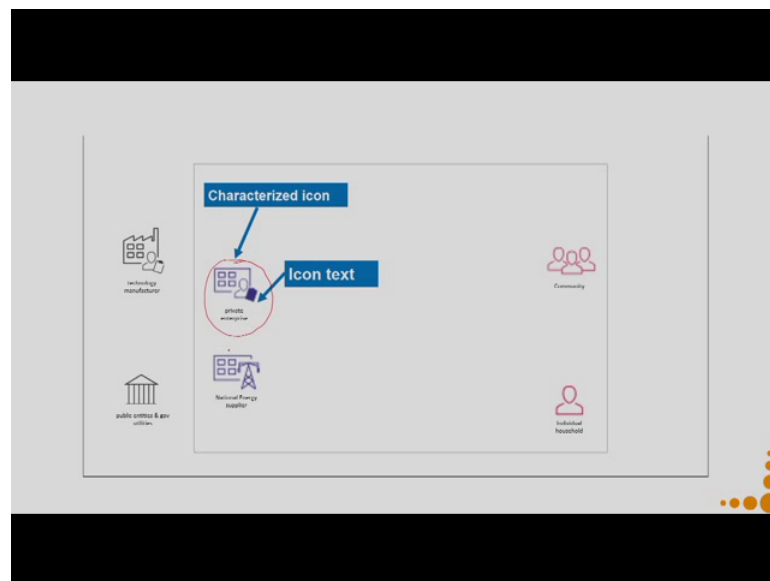
We have certain icons for them; I will show you the icons in the next slides. So, you can use those icons, you can also come up with their own icons. So, before making a system snap you have to clearly define what are your icons and what do they mean. So, usually the norm is I will have these icons and there will be an icon text. So, I can have a so, this is my icon for a private enterprise. Now, in this particular context I can keep on changing the name. So, fresh is a private enterprise. So, I write fresh over there, but the icon remains same what I come to understand is these are all private enterprises, which is they

run from a government enterprise this is so, you have characterizing icon and you have a icon text.

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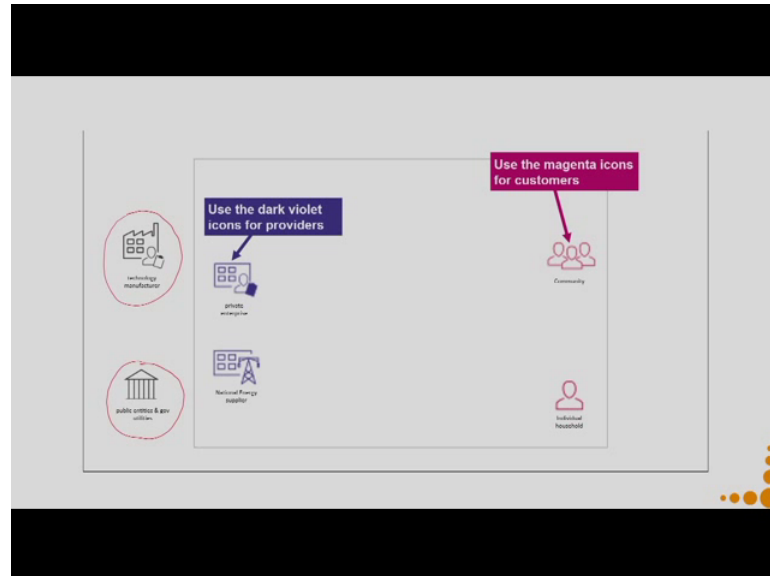
We use dark violet icons for the provider side and we use magenta icons for the customer side. In order to visually very clearly see a difference between who is the provider and who is the customer? Here you can see, because these are secondary stakeholders they are all black in color. They neither have the violet nor are the magenta, they are not the providers they are not the consumers. They are the secondary stakeholders, who bring in the system requirements.

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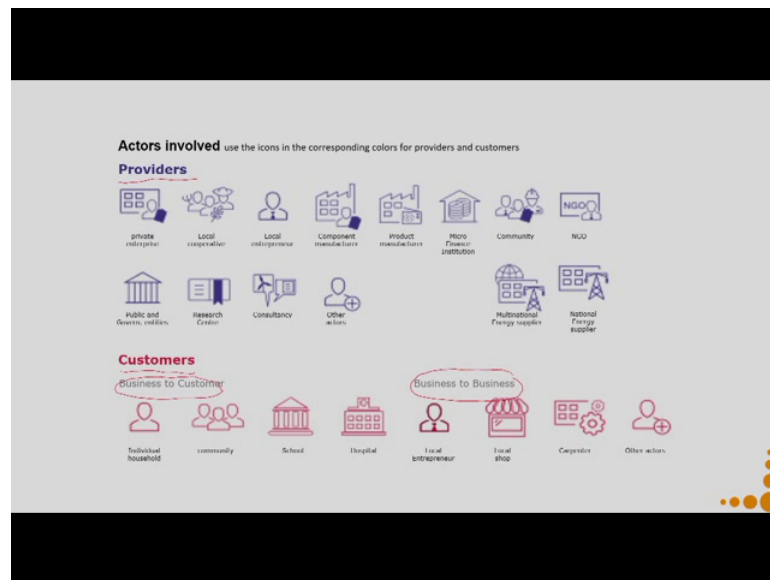
So, this is how before starting my systems map when I have done my identification of actors, I will first create the set of icons that I am going to use for all my actors. So, these are my first is my list of providers, second is my list of customers. My customers can be 2 types business to customer. So, fresh is a business and if I want to buy it for my house I am a customer.

So, it is a business to customer system. It can be also a business to business say for example, I fresh is a company I am also a company I am a company and I make drinking water in my company for my employees. So, I buy this water purifier from fresh. Now, this is a sale which is from business to business sale.
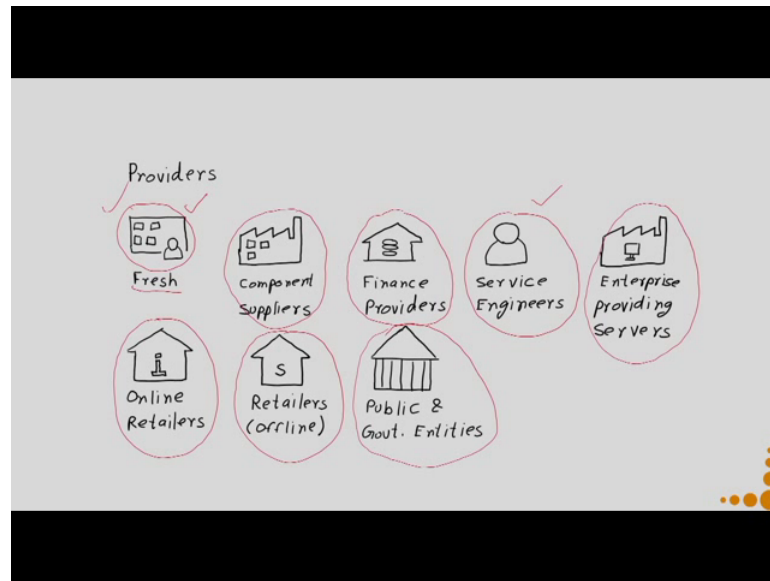
So, see for example, this is the kind of list of actors that I identified for fresh as the provider. So, the first one is fresh itself. So, this is my icon for a private company, this is my icon for a private company and below that I write the icon text. Which is it is a it is a fresh, it will have some component suppliers. So, in case this is an important component I can also classify them as 2 or 3 different component suppliers or I can also put them in one particular category, it depends on what is the importance of that particular stakeholder? Then I might also need some finance providers, because my water purifier might be sold in the market with the finance team along with it.

So, as a result I am putting them is also in the provider list, I have my service engineers who are provided by a particular agency. So, I am calling them as another so, here you can see the first icon is an entity which is a enterprise, this icon which represents a individual. So, in this particular context if my service engineer in my system I want to talk about service engineer as an individual I use this icon, but if I want to talk about service engineering agency, I will have to use this first icon, then I talk about my enterprise providing servers, because I am going to have call center and I might be having some it related things. So, say my water purifier is a smart purifier. So, I will need some server enterprise server provider. So, help to run those smart devices.

I might be also selling my product right now through online retailer so; they are also pro part of the provider list, I might be also selling them through offline retailers, I might

also have some wholesalers in between so, I have to make those icons also and there might be also. Some relationship because of the public and government entities not sure if they exist, but say in this context which I am drawing my actors I think that they are part of the providers.

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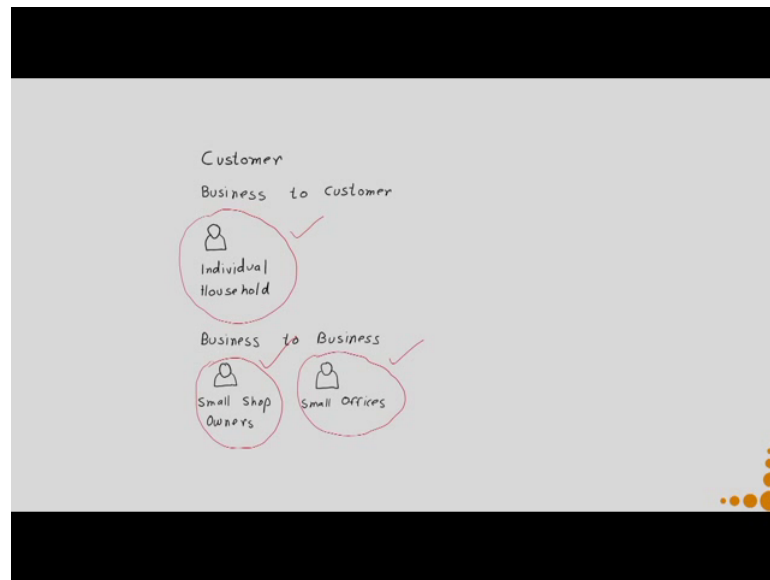
Then, say right now fresh has 2 types of customers the business to customer is like individual households, where people buy from their houses, but there are also a small shop owners or small officers, where the number of employees is like the number of people in a family. So, they also have a small business to business sale in which they sell to small shop owners or small offices.

Why do we need to identify each one of them, because they when if they contributed anyways, because I reach the households in a different manner, I have to reach my information the advertisement campaign has to be different for these people. They might also have different kinds or say a small office or a small shop owner not necessarily a shop owner, but may be a small office might also go through a tendering process. So, in this case I have a very different approach to the whole selling thing.
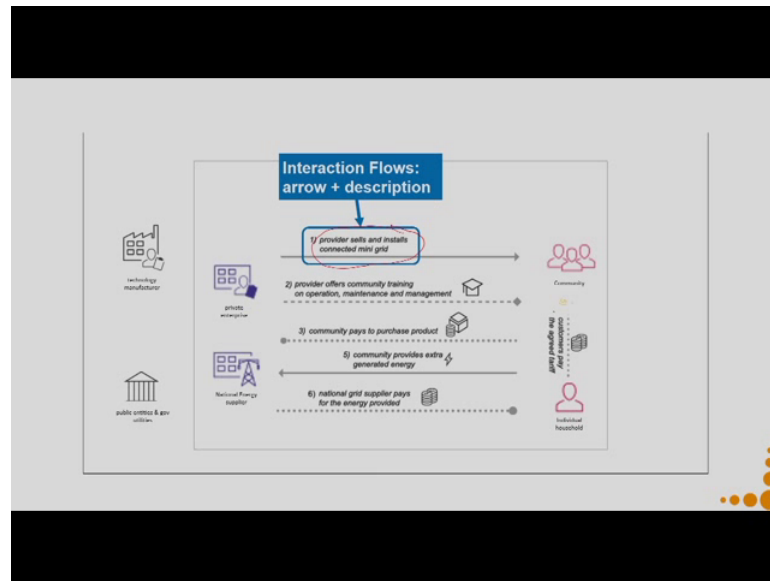
So, once I have identified all my actors, what my next step is, what are the interaction flows? How do I show the flows I have an arrow and a description the arrow is in a direction in which it is good? So, for example, fresh gives materials to the customers, which means it gives a product. So, it is the material flow. So, my direction of flow is from fresh to my customer. So, the arrow will be directed towards my customer, the money which is the payment for the product that the customer bought goes from customer to fresh.

So, the direction of the arrow will be towards fresh. So, the interaction flows have to be mapped with an arrow and description, like here you can see x has provide us sells and installs connected many grids. So, it tells what it does? So, for my example it can be fresh sells and installs the water purifier in every in every household.
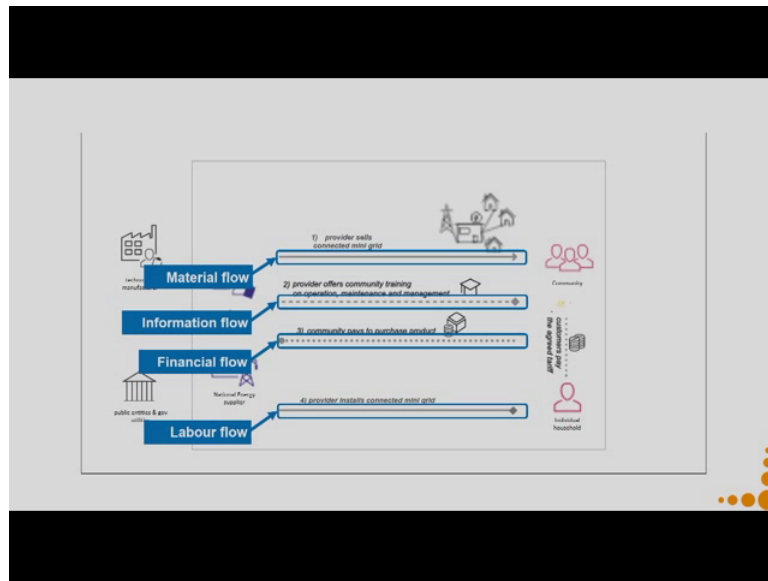
We have different types of arrows. So, the material for flow arrow is how the first arrow looks like it is a solid arrow it is a solid line with a triangular arrow. The second type of line and arrow is used for information flow, the third one so, it is a dotted arrow as well as a dotted line that is used for finance flow, the fourth one the line is same like the material flow, but the arrow is different the arrow is a diamond shaped arrow. So, that is used for labor flow.

Then, we need to identify what is paid? So, there are different icons for doing that say for example, you have a very different ways in which the payment is suppose to be done and it does not fit into all the modalities, which are shown on this particular screen you can create your own icon, but large number of those modalities are already covered. So, the first one is spray paper period, then paper time of access to energy, paper use of satisfaction unit, in kind contribution, then there can be also hybrid payments, which can be a combination of couple of these types.

Then, what is the payment modality are you paying by mobile phone, scratch card, or and energy credit codes or meter codes fee collection credit card or cash transaction or something else. Say for example, bit coin bit coin is not there over here then comes to services. So, what are the services which are also to be involved to do it? So, say for example, as I told you the fresh offers the product on a through a financing scheme to the customer. So, this financing scheme is not owned by fresh this financing scheme comes from an another organization. So, which is like the organization which is providing the service of financing?

Installation is another services, which might be given to another company might be hired for doing the installation services. Similarly, training, use optimization maintenance and repair upgrades end of life treatment.

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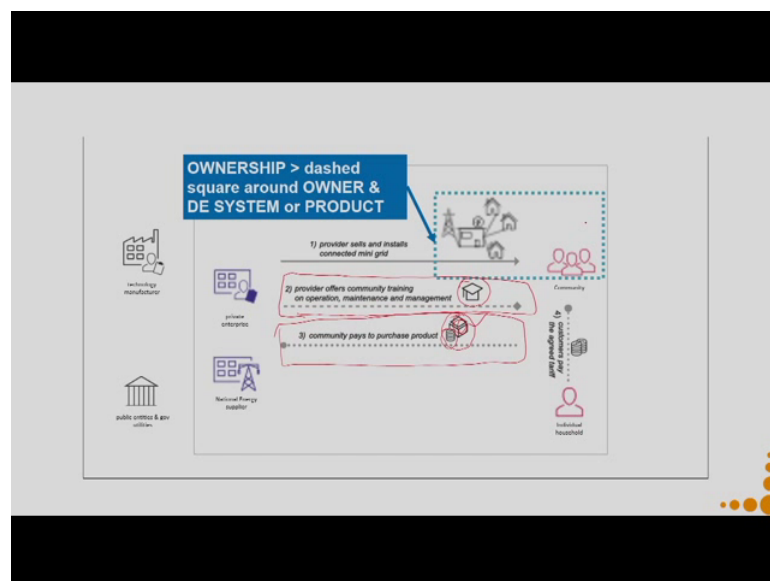
So, how do we do it? So, say for example, in this particular context you can see, that this private enterprise provides of provider offers community, training on operation maintenance and management. So, there is a training service involved to the community. In the second example you can see community pays to purchase product. So, we can go back to this particular slide and try to identify what does that icon mean? So, you can see that icon is so; here there is a fee collection. So, there is money and a person who is collecting that is not part of that? So, there is money collection service there is certain other enterprise which is providing it.

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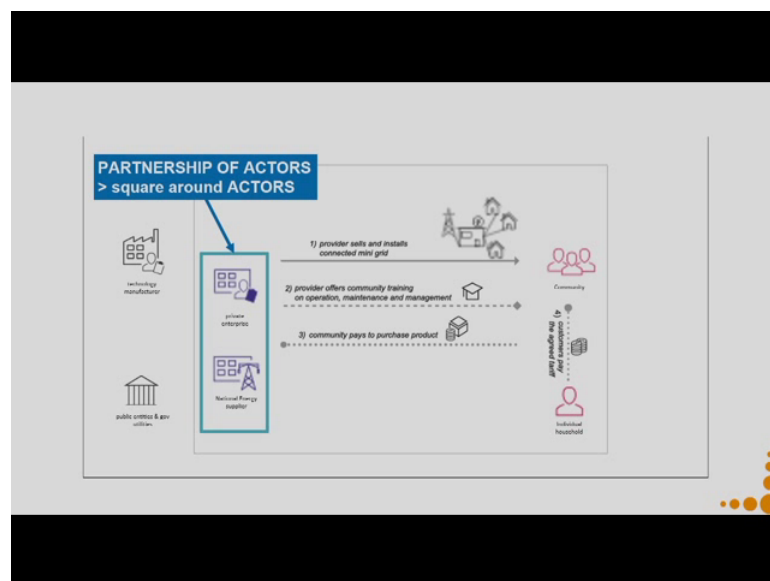
Here, I have shown the ownership, which is with a dash square, which is the owner of the product or de system, and then you also show who all are the partnership of the actors who provide it?

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Overview of Processes in Strategic Analysis

Process	Sub-process	Result	Tools
Project promoter analysis and definition of intervention context	Defining scope of design intervention	Document specifying scope of intervention and design brief	
	Project promoter analysis	Summary of project promoter analysis: - Mission - Main expertise - SWOT - Value chain (actors, structure, etc.)	Preparatory company questionnaire miniDOC SWOT matrix System Map

So, from this what we get to know is how do we do the project promoter analysis and definition of intervention context?

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Process	Sub-process	Result	Tools
Reference context analysis	Production and consumption system analysis for the scope of design intervention	Summary of production and consumption system analysis for the scope of intervention: - Identification of actors and their interactions - Identification of technological, cultural and regulatory dynamics	System Map miniDOC
	Competitor analysis	Summary of competitor analysis: - who are the competitors and what are the most innovative offers; how is the market segmented competitive position analysis	Model 5 Porter forces
	Client and/or end user analysis	Summary of client/end user needs: - Analysis of expressed and latent needs	Exploring Customer Needs miniDOC

In the next lecture we will start with the next process which will be about reference context analysis.

Thank you.