





Adapt the value chain  
Find stakeholders and KOLs  
Determine Specifications  
Analyze total costs

Technology Innovation for Sustainable Development

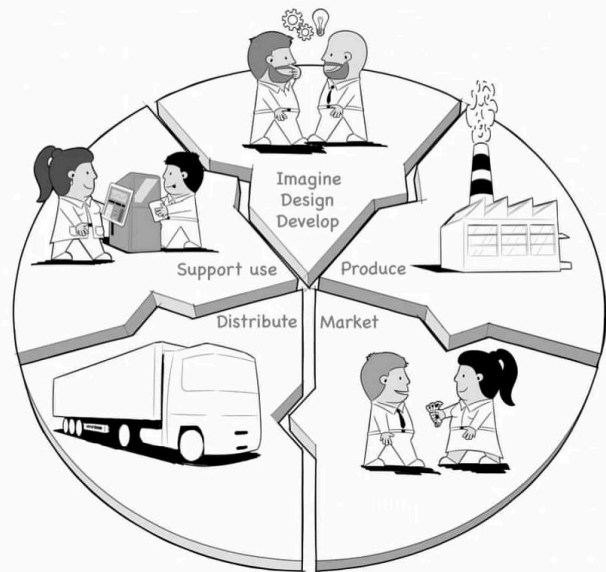
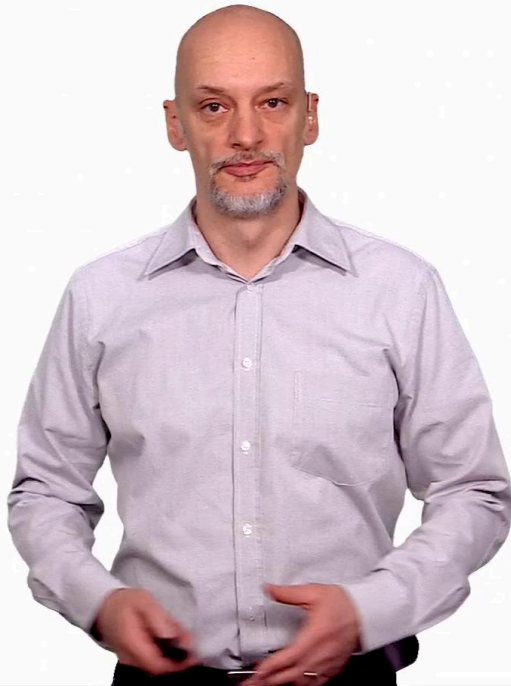
Hello. In the previous videos we have seen the product value chain tool. Now, we would like to show you how it can be used in a specific project. To illustrate this, we will be using our case study of an x-ray system designed for low-income contexts. Again, this tool must be used as a basic guide to work in a team. Its goal is to help raise the right questions and to stimulate reflections so that we won't be missing crucial aspects as our project develops. The first step is to adapt our generic product value chain to the specific case of our project. Then, the tool can be used to map stakeholders as well as key opinion leaders or KOLs which are particularly important in any project. We will see how to use this chain as a framework to define specifications. Finally, the tool will help us analyze the total costs involved.

Notes

Summary



# Adapt the value chain



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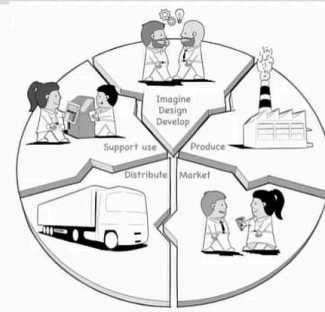
As discussed, we start with our generic product value chain which we have seen in the previous videos. The method is very simple. We need to bring together a small group of knowledgeable people. For that purpose the best is to harness our professional and private networks. In our case, we look for people who know the context of Cameroon as well as the market of diagnostic imaging. Of course, we focus on Cameroon first but we keep in mind that we will want to expand on a much wider scale later.

Notes

Summary



1m 19s



Radiologist  
 Xray engineer  
 Xray Market expert  
 Logistics expert  
 Radiographer

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For this first step we need to pick people who each know something about a specific segment of the chain. In our case, it includes a Cameroonian radiologist as well as an engineer who knows the technology of diagnostic imaging. We include one person who know the market of diagnostic imaging devices and one person who knows practical aspects of shipping and logistics. And finally, we also include a radiographer who as you remember, are the main users of radiology machines. This initial selection of people will help us make the next step which is to expand the value chain into something more specific to the domain of radiology. Of course, you may find it hard to assemble the right the ideal team and there will certainly be some knowledge gaps. This is perfectly okay as discovering those gaps is already an important deliverable at this level of the process. At this stage we must resist getting lost in details about how things will be implemented. The only objective is to identify main segments of the chain and to come up with a more specific but still quite general value chain for our product. We must resist the natural tendency to make things more complex than they need to be.

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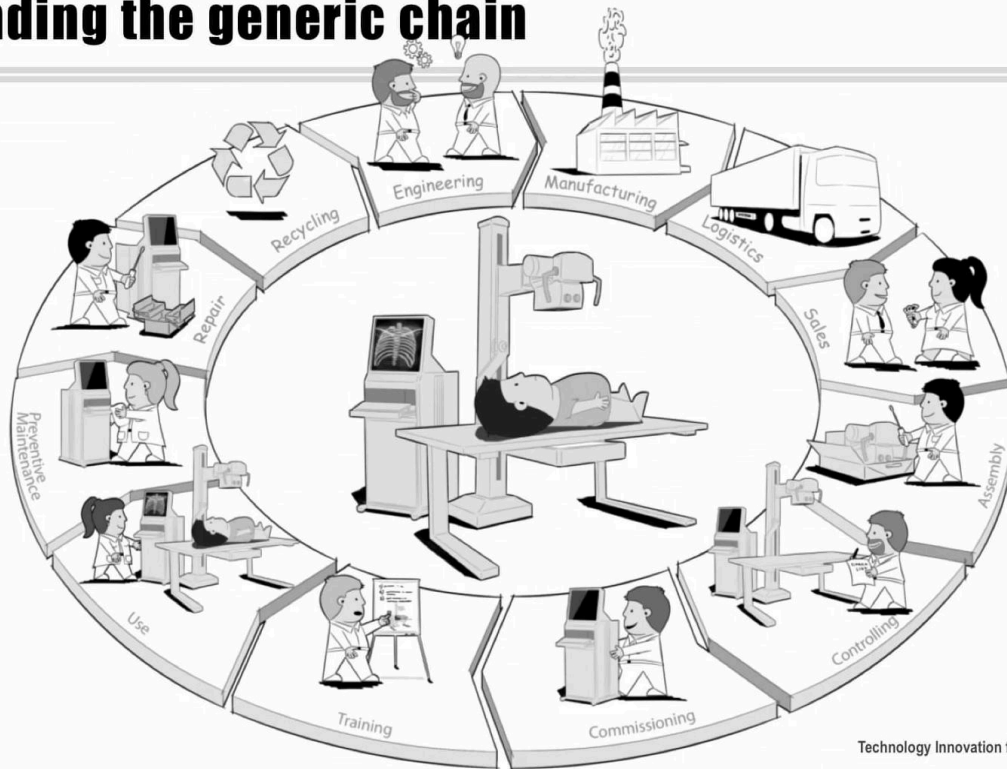
Summary



1m 57s



# Expanding the generic chain



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Here is our product's specific value chain for the diagnostic x-ray system. As you can see there are now 12 segments instead of 5 which is not that many. In spite of its relative simplicity it allows to highlight crucially important elements as well as their sequence. First, the team has decided that the different parts of the x-ray system needed to be produced outside of Cameroon as there are little possibilities for local manufacturing. They are then shipped to a warehouse until the sales transaction is finalized. The system being quite bulky, it will then need to be assembled close to where the customer is. If we continue to follow the chain, the product will need to be controlled to assure that it is in perfect condition before it can be put into service. Then, the device will need to be formally commissioned at the customer site, which is a district hospital for instance, where infrastructure needs to be prepared. As we have seen, diagnostic imaging involves ionizing radiation and quite a bit of know-how to properly operate the system. This is the reason why training was given such a specific importance here.

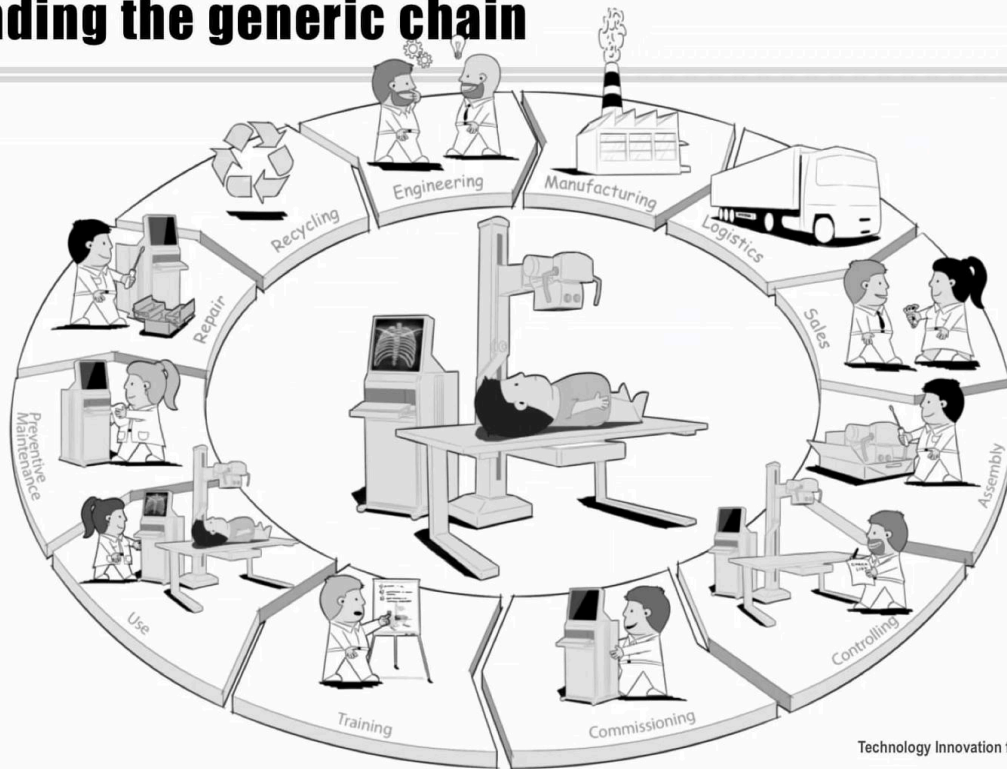
Notes

Summary



3m 25s

# Expanding the generic chain



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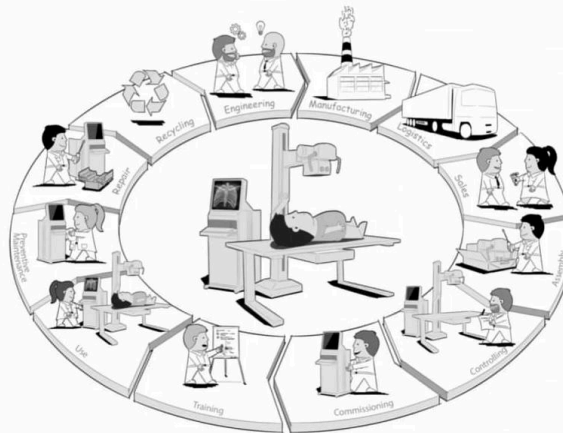
Then of course we have all aspects related to how the system is being used, maintained repaired, and recycled at the end of its useful life. Note that the process is circular and that we need to consider technology reengineering. For example, to deal with obsolescence of components or to develop software upgrades. As you can see this is still a quite heavily simplified vision of how things will be working in reality. However, it allows us to go one step further and to identify stakeholders.

Notes

Summary



4m 44s



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As a quick reminder, stakeholders are people, companies, or other entities who can affect the outcome of our project or our potentially affected by it. It is very important to identify them early on because they are crucially important for the success of the project. Some of them will be especially important for the uptake of the technology once it is available. Their opinions are widely respected and they will be involved in important decision-making processes such as the decision to acquire our product. In industry, this specific group of stakeholders is called Key Opinion Leaders. It is of outmost importance to integrate them into our project right from the start. Our product value chain can be used as a framework to map these stakeholders. Again, this needs to be done as a team. For each segment the project team needs to determine who are the key players. In our case, the following stakeholders have been identified.

Notes

Summary



5m 24s

# Stakeholder identification



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For the engineering part, since the team has decided to restart from scratch, it has identified several groups at engineering schools which are working on the design and development of x-ray technology. For manufacturing, the team has identified an x-ray manufacturer who already has experience in particular for the high voltage electronic parts. For logistics, the team has decided that a freight forwarding expert should be involved. A company was identified which has experience with shipping to Cameroon. For sales and marketing, the team has determined that the main customer or buyer of the device is the Cameroonian government. Since x-ray systems are considered capital equipment, the Ministry of Health usually issues Call for Tenders. There are other stakeholders such as NGO's and private hospital chains is also involved. NGO's can be seen as a potential customer or even as a competitor if they focus on donating medical equipment which as we have seen is generally not sustainable. For assembly, there is a need to understand the local tax rules to determine and how far local assembly can help reduce taxes.

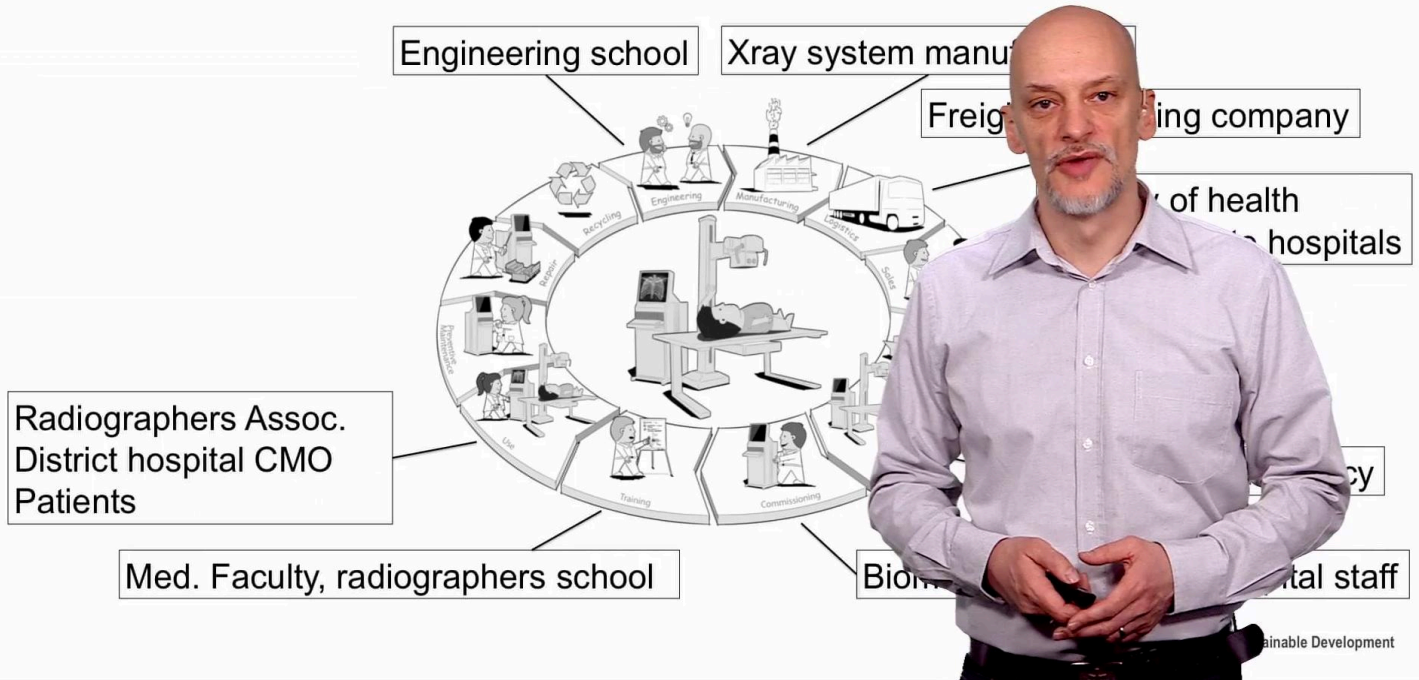
Notes

Summary





# Stakeholder identification



Customs are obviously a key stakeholder in this regards As far as controlling, the team has found out that Cameroon has a radio protection agency which is a crucially important local stakeholder as it delivers the authorization to sell and to operate the technology in hospitals. For commissioning, local biochemical engineers and hospital staff in district hospitals are important because they will need to prepare the facility and infrastructure. For training, the team has identified a local school which trains radiographers. The head of the diagnostic imaging department of the main university hospital in Cameroon has also been identified to be an important stakeholder. As a professor, he not only train radiologists but he also is a reputable key opinion leader on this subject for the whole country. For the use of the technology, there is a local professional association of Cameroonian radiographers and also since the x-ray system is intended to be deployed in district hospitals, the chief medical officers or CMO's of such hospitals are highly important stakeholders. They know the problems faced by their staff on a daily basis. Finally, it is obvious that patients represent a crucial stakeholder group.

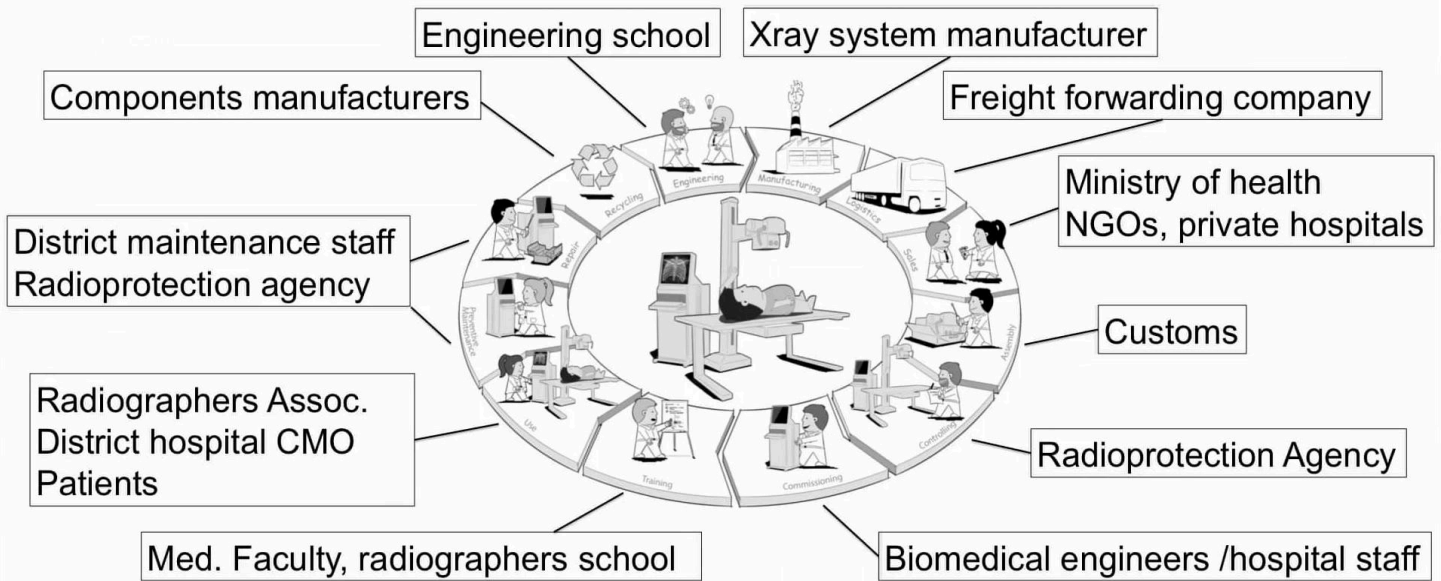
Notes

Summary



7m 53s

# Stakeholder identification



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Think for example what would happen if we developed some technology which looked scary or dangerous to them? As we have seen, maintenance and repair are absolutely essential in this project and in the context all together. This is why the maintenance staff available in district hospitals is a very important group. Again, the radio protection agency is important here because it enforces legislation regarding calibration, maintenance, and repair. Finally for recycling, since there are potentially toxic components involved such as the oil in the high voltage transformer, the manufacturers' of those specific components are important in this regards. Of course, there are many more stakeholders which we will discover as we repeat the exercise later in the process and with different people. However, as you can see this very crude first approach allowed us to identify and map some key players. We can now try to better understand the influence that each one of them could have on our project.

Notes

Summary





# Stakeholder Classification

Stakeholder	Interest (1-5)	Power (1-5)	What's in it for him?	Concerns
Radiation protection agency	2	5	Participation in the design activities, Reputation	Respect of legislation, clean documentation
District hospital CMO	4	4	Good images, digital	Not a known brand

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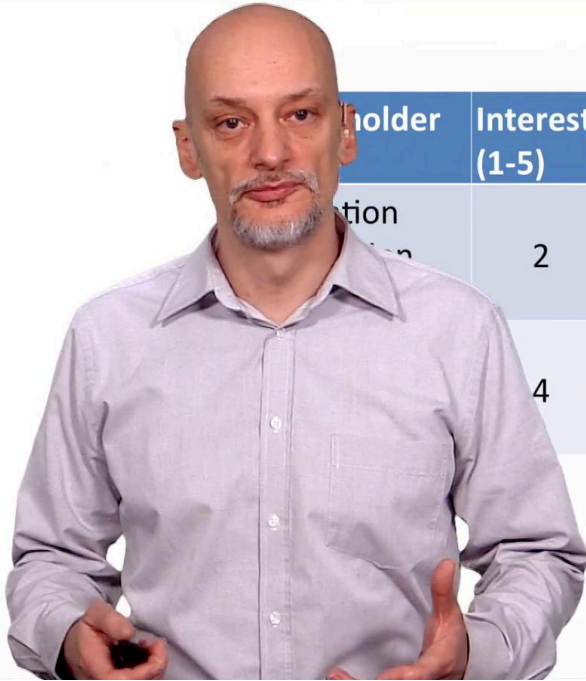
For this purpose it is interesting to create a table which allows to classify them for their importance. An example of such a table is given here. It is useful to rate the stakeholder in function of the level of interest he has in the activity. We need to remember that the value chain is not only about providing value to the user, every stakeholder involved will only facilitate the activity if he perceives some value for himself as well. The key question to remember is what's in it for him? The second important aspect is the power that the stakeholder has. In our example here, the radiation protection agency's interests could be to participate in an international project which could increase its reputation. On the other hand, it has the power to prevent the sale of the product. This stakeholder, thus, has maximum power but only little interest which may represent a problem for our project. This should lead us to apply special care to assure that this stakeholder will stay on board. The last column is what the stakeholder is concerned about. In our second example, a chief medical officer in a district hospital will certainly find it great to have a digital system providing good quality images. However, what happens if he is confronted with a new supplier without a well-known brand? How can he be sure that the product will deliver its promises?

Notes

Summary

10m 45s





Stakeholder	Interest (1-5)	Power (1-5)	What's in it for him?	Concerns
Government	2	5	Participation in the design activities, Reputation	Respect of legislation, clean documentation
Media	4	4	Good images, digital	Not a known brand

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As you can see, this simple first step beyond the generic product value chain has allowed us to identify key stakeholders and to explore what their potential influence could be in our project. Of course, this is only a first step and it is important to review our stakeholder map on a regular basis. This needs to be done as a team involving people who have a deep knowledge of the different stakeholder groups, if not, with representatives of the groups themselves.

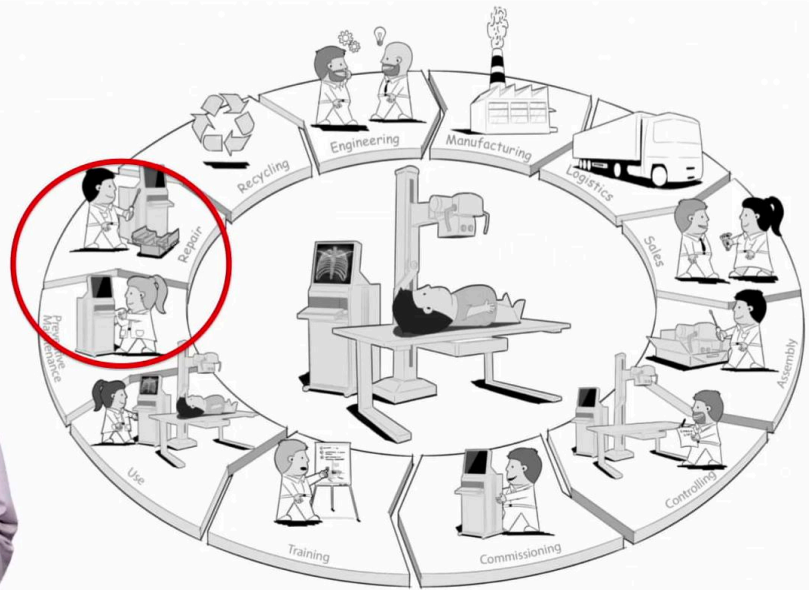
Notes

Summary



12m 30s





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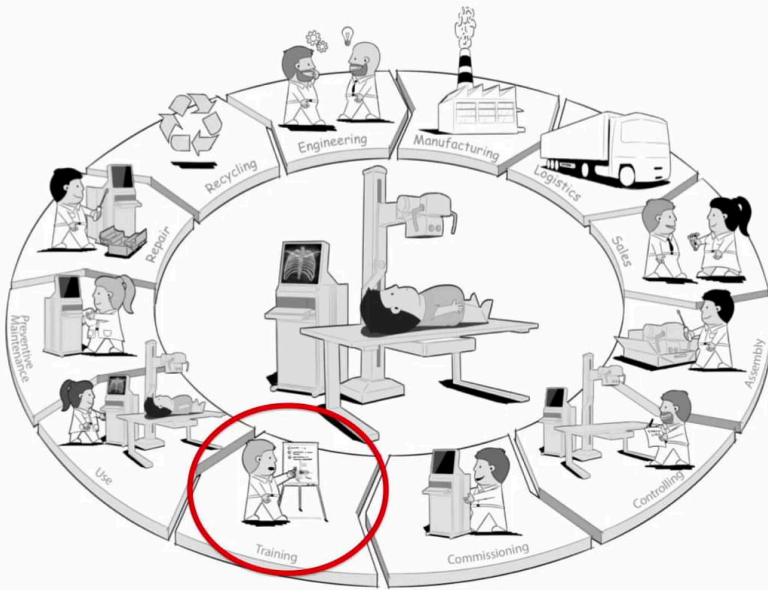
Yet another use of this value chain is to identify product specifications. As a good start, we can create a document based on the specific segments of the chain. For example, if we look at the logistic segment we realize that we need to define the conditions of transport of our technology such as maximum temperatures, vibrations, and shocks. As another example, let's take training. We need to specify what the average level of training of the users will be since this has important consequences. For example on how the user interface will be designed. On the other hand, it can lead us to specify that user software needs to involve a tutorial that will help bring a new user up to speed. Of course, the functional specifications related to user expectations are of core importance. For example, how many images will be made per day? What is the required image resolution? Or what are the maximum exposure parameters? As yet another example, we need to specify the amount of maintenance capability which can be asked from the user. Can we expect that the user will be doing annual calibration of the imaging detector? Is there any material involved or calibration tools?

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Summary



13m 08s



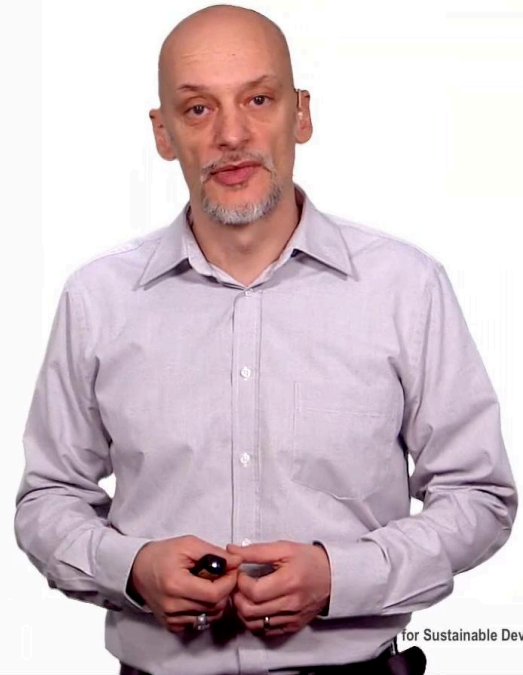
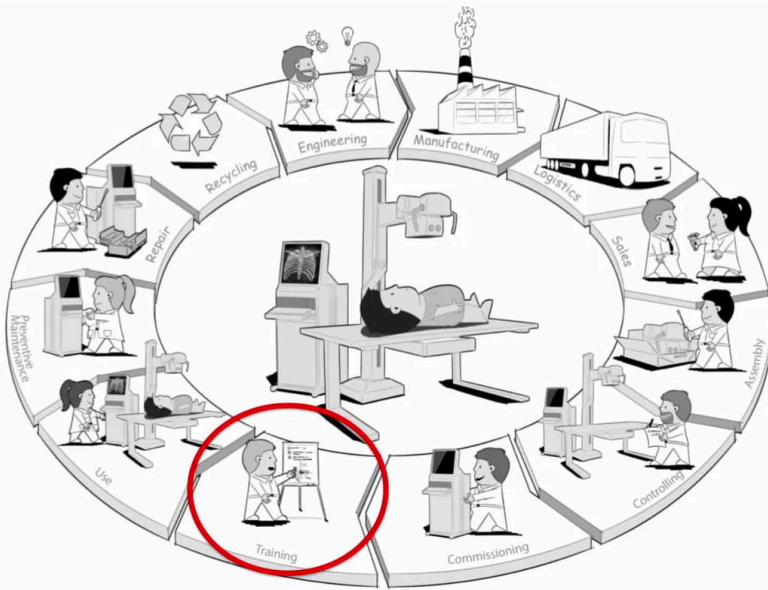
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In the x-ray project it was determined that it could not be expected that any maintenance beyond simple cleaning will be done and the cleaning itself may involve aggressive chemicals such as bleach. These specifications are crucially important as they determine the product development and the business model strategy. Finally, we need to plug financial figures into every segment. For example, how much would it cost to manufacture or transport the devices? At first it will only be a rough estimate based mainly on discussions with stakeholders and we will refine the analysis as we progress. For each segment we need to clearly distinguish two perspectives, the cost perspective and the price perspective. For example, let's take the training segment. If we assume that we subcontract the training we will have to determine the price. We would have to pay to some local company which would then provide the training. On the other hand, if we decide that we as a company will assure the training ourselves, then we need to determine how much it would cost us in salaries for the trainer to send them to the hospitals, etc.

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For each segment this will lead us to reflect about whether we should pay a partner to do the work or if we should vertically integrate these tasks into our company. The difference is not only strategic because we would need to find a reliable partner but also financial since that partner will want to have a profit margin. The influence of this decision is extremely important as it will determine how profitable and how sustainable our company will be. Finally, we can also look at the value chain from the perspective of the buyer. This will allow us to come up with an estimate of what is called the Total Cost of Ownership. In the case of x-rays, for example moving away from films and choosing a digital technology allows to drastically reduce cause of ownership in the perspective of the hospital. Indeed, films are expensive and have a limited shelf life, etc. In the next chapter of this MOOC, we will look at our third tool which allows to analyze the company's business model in order to find the right balance between cost and revenues. For now, the product value chain mainly allows to identify the cost involved. I hope you are now convinced of the power of this tool. I encourage you to use it as often as possible to improve your understanding as you progress in your project. Goodbye.

Notes

Summary

