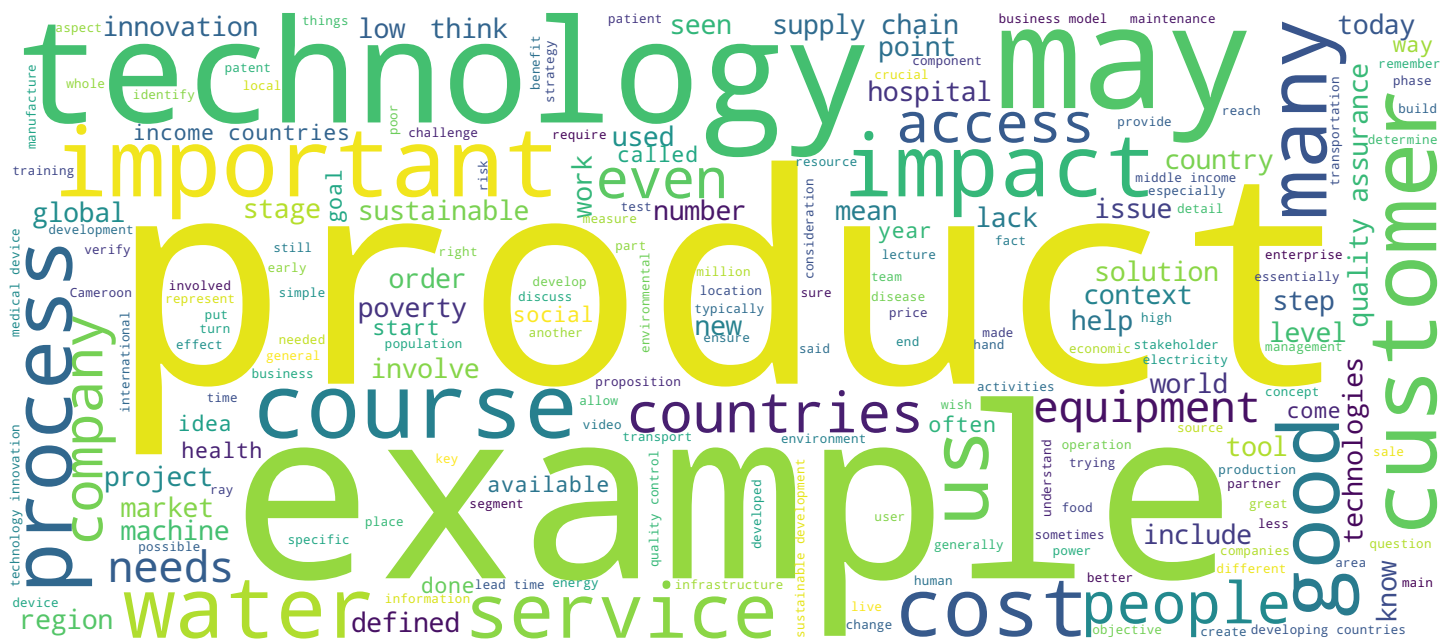
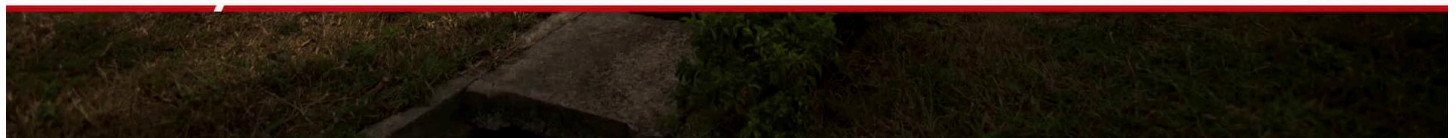




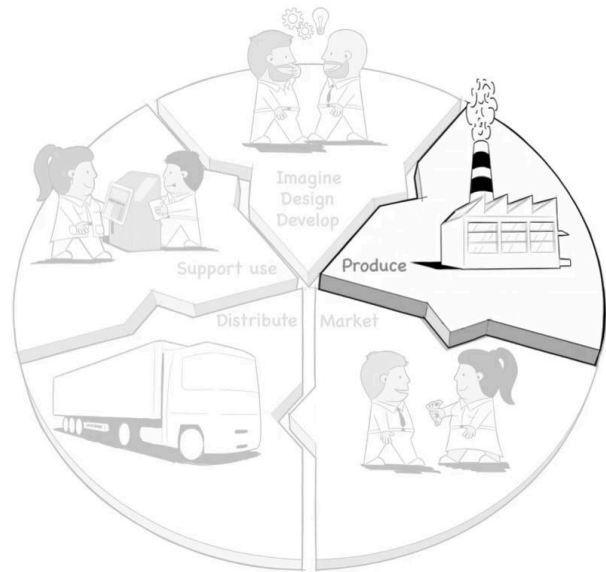
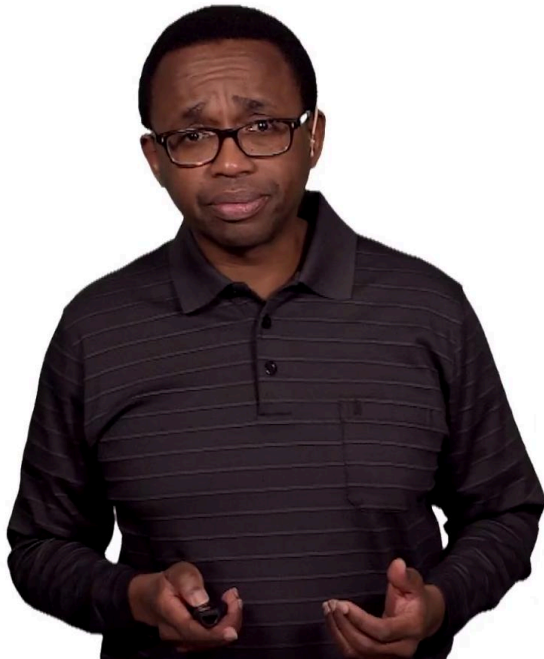
ÉCOLE POLYTECHNIQUE  
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**EPFL**



# The Product Value Chain: Produce your Product



Technology Innovation for Sustainable Development

Hello. You have now reached a stage where you need to create a product from your innovation concept or idea. As we said all along, we don't intend to give you a course on how to manufacture products but rather discuss what we consider to be crucial points for consideration for products conceived or destined for developing countries.

Notes

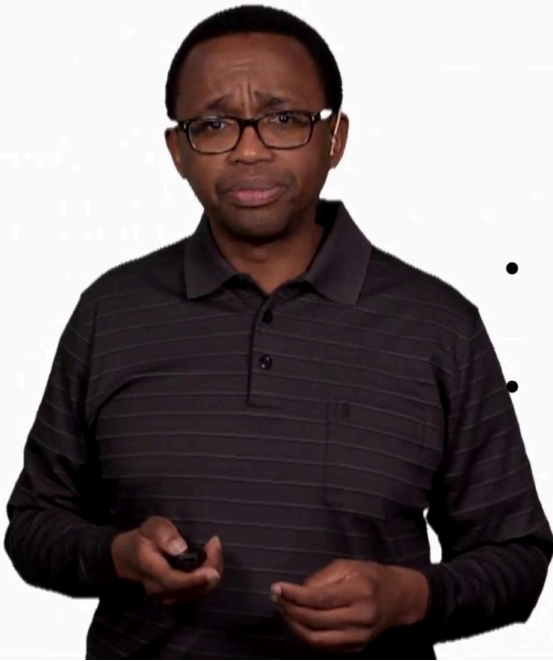
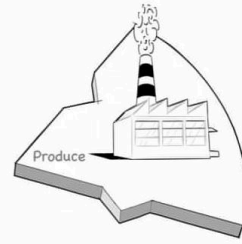
Summary



0m 13s



# Produce: Manufacturing



- To Manufacture, or not to Manufacture?
- Location

Technology Innovation for Sustainable Development

Manufacturing can be defined as a value added production of merchandise for use or sale using labour, machines tools, chemical and biological processes. Or in very simplified terms, manufacturing is the process that turns your idea into a product. Now, before you begin putting together your manufacturing strategy you need to remind yourself of who your target market is and what price point you wish or need to reach. After that, one of the first things you need to think about is which elements or components of your idea or innovation really need to be manufactured from scratch, because in most cases the product can be realized using existing or available components, for example, and bearing in mind that when you manufacture any product you will almost always have various options on which materials to use and which process you select to make it. And the target market and the price points you are trying to reach will play a decisive role on what choices you make. Now the next major question to confront is do you manufacture at home, or do you outsource this abroad, that is offshore? because today the Contract Manufacturing industry is highly developed and now extends far beyond China.

Notes

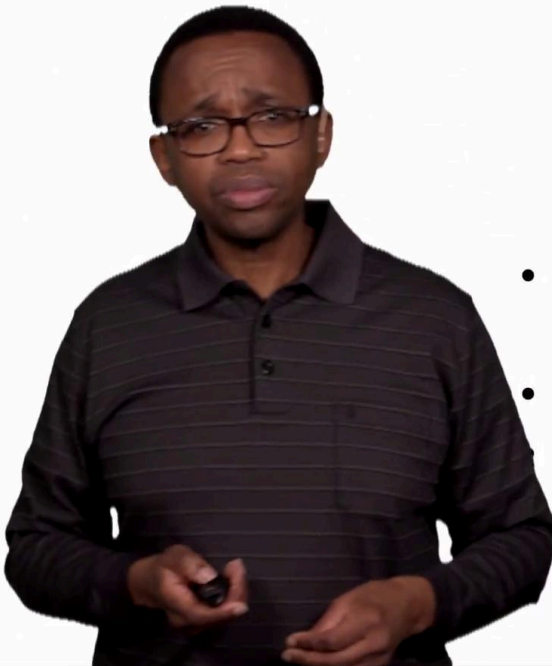
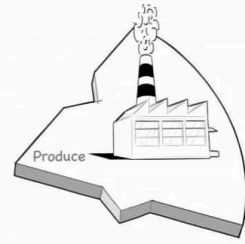
Summary



0m 36s



# Produce: Manufacturing



- To Manufacture, or not to Manufacture?
  - Location
- Supply Chain Management  
Quality Assurance & Control

Technology Innovation for Sustainable Development

And most of them offer a turn-key solution, that is a one-stop shop that includes packaging and direct delivery to your client's doorstep. For technology based products, especially, it is highly advisable to well understand if and how this industry can add value to your strategic objective. However, you should bear in mind, though, that the manufacturing sector is often highly coveted by policy makers in developing countries. It is viewed as an instrument and catalyst of modernization and skilled job creation, as well as a source of various collateral industries. Governments also promote local manufacture with special tax concessions and reduced tariff rates for importers of manufacturing machines and equipment, as well as giving preferential status for government tenders to locally manufactured products. Now, a very important issue to look into also during the process of selecting the operational location is that of supply chain management, which is essentially the management of the flow of goods and services into the company as manufacturing inputs, or out of the company as products. You will need to be fully comfortable on how you will manage this critical process before you begin.

Notes

Summary

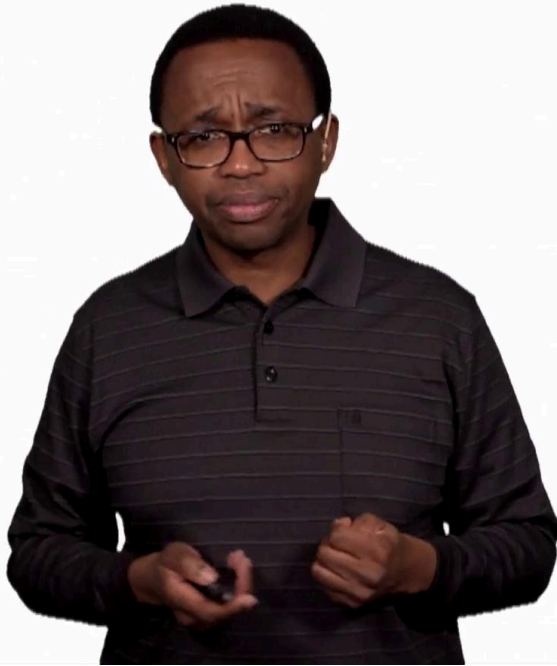
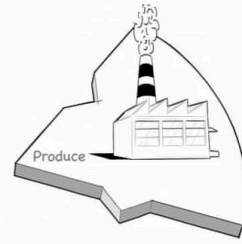


2m 03s





# Produce: Manufacturing



- To Manufacture, or not to Manufacture?
- Location
- Supply Chain Management
- Quality Assurance & Control

Technology Innovation for Sustainable Development

Now, once you have dealt with the issues above you will need to commence planning of your operation in more detail. And one of the top priorities will be to devise and implement a suitable quality assurance system. For technology based products, especially, which can be relatively complex, it is very important to have this in place even before you start your operations.

Notes

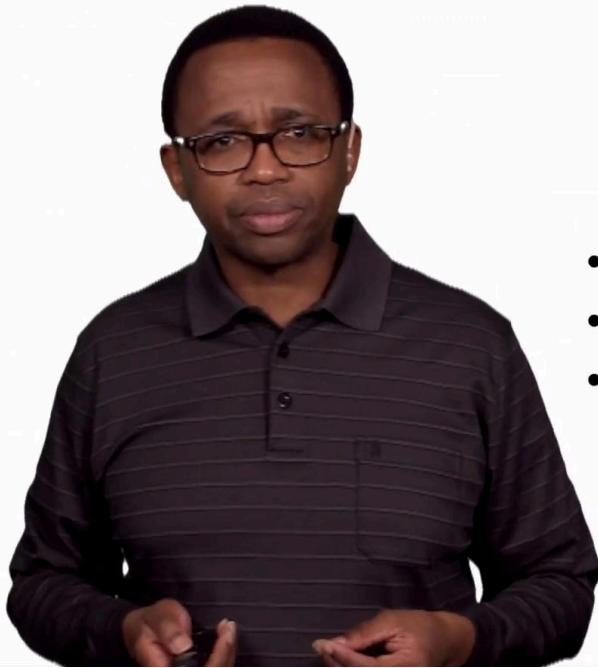
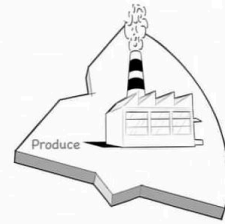
Summary



3m 34s



# Produce: Location



- Evaluate your strategy
- Skilled Workforce
- Adopt Total-Cost Approach

Technology Innovation for Sustainable Development

When it comes to choosing a location for production there are a number of practical and key considerations that can help you make an informed decision. First of all, evaluate your game plan, which means start by clarifying the organization strategic goals and objectives. Do you intend to reduce cost, for example? Or serve a new market? Or expedite response time or diversify risk? The consideration of broad organizational goals into the decision will help to support the long-term sustainability of your manufacturing investment. As we mentioned before, one of the main challenges faced in the regions of relevance to this course is the lack of the skilled workforce. Be sure to do your homework diligently and meticulously and verify that you will indeed be able to find the key required skills for the job. It maybe necessary to import certain of these skills from abroad, especially senior personnel who may come for a certain limited period to effect a skills transfer. So it will be helpful to also select a location that may have some appeal to foreign citizens. And one of the best sources for this option is actually the foreign embassies of the countries of your interest.

Notes

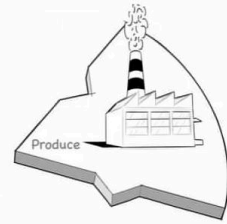
Summary



4m 02s



# Produce: Location



- Evaluate your strategy
- Skilled Workforce
- Adopt Total-Cost Approach

Technology Innovation for Sustainable Development

Look beyond labour costs, apply a Total-Cost decision model. The location with the lowest labour costs may not necessarily be the preferred one or even the most cost effective place to do business. To make the right choice, consider a wide range of factors, including everything from cost of transportation and electricity, to supply chain risk and tax incentives. Identify and prioritize all the needs of your business and see how each location compares against your specific requirements.

Notes

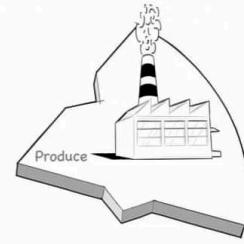
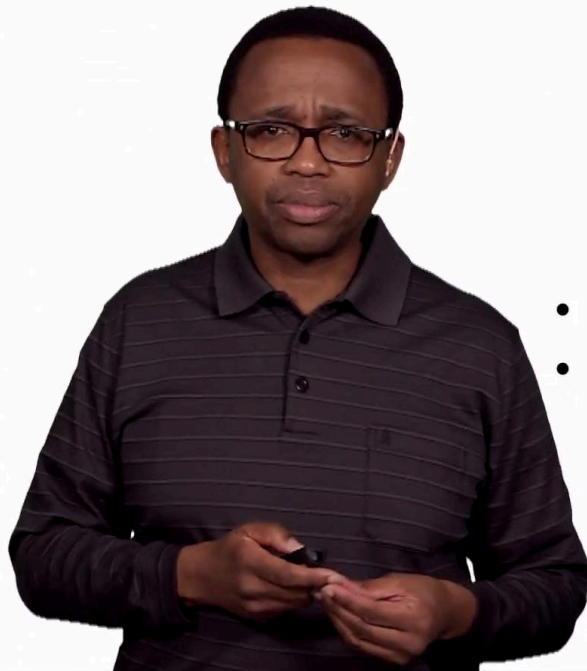
Summary



5m 31s



# Produce: Supply Chains



- Consider entire supply chain
- Be aware of regional discrepancies

Technology Innovation for Sustainable Development

Now let's discuss supply chains. The supply chain management is defined as the management of the flow of goods and services. It involves the movement and storage of raw materials, inventory and finished goods from the point of origin to the point of consumption. Establishing a viable and sustainable market in a region requires, first and foremost, that customers have reliable access to your products. Therefore, before you begin manufacturing pay careful attention to supply chain details in the area where your manufacturing operations will be carried out. This point should be also be factored in during the selection process of the manufacturing location. You should consider the entire supply chain because many modern factories are really just assembly operations with much of the actual manufacturing done by upstream suppliers. So when deciding where to locate eventually proximity to your customers should be an important factor in fact. Now for example, if we look at sub-Saharan Africa there are significant variations in the logistics costs and lead times required to access different African markets.

Notes

Summary

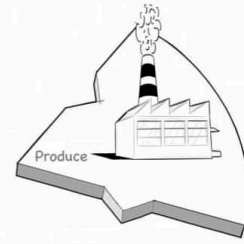
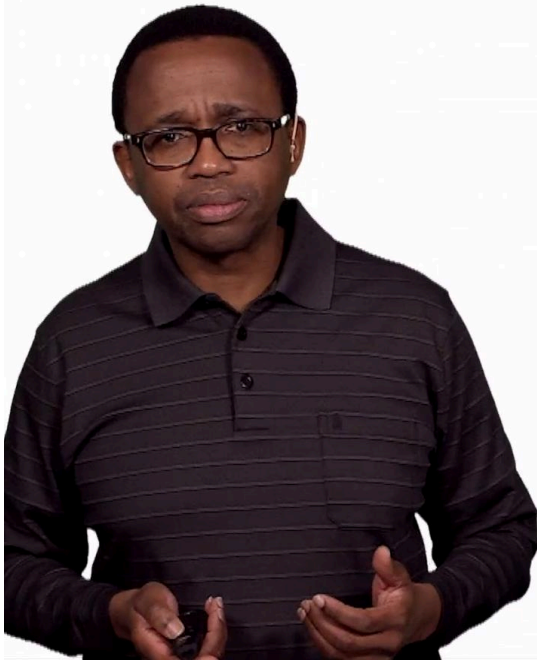


6m 06s





# Produce: Supply Chains



- Consider entire supply chain
- Be aware of regional discrepancies

Technology Innovation for Sustainable Development

Today, for example, the air freight hubs of Nairobi in Kenya, Addis Ababa in Ethiopia, and Johannesburg in South Africa provide sufficient capacity to meet current needs in those regions, while air cargo capacity in West Africa is still limited. Same with ports, important automotive parts through Port Apapa in Nigeria will take over three months, while importing the same parts through Durban in South Africa takes only one month. And these delays and lead times can be detrimental to the enterprise. Now to avoid these delays, the enterprise may elect to hold an inventory of big size and high variety, but for small markets holding such a big inventory may not be justified, because there may not be sufficient demand to off-take it all. This means that they have to order according to the needs, and with the longer lead times compared to their counterparts with the better supply chain resources, they may suffer reduced responsiveness, flexibility and overall competitiveness.

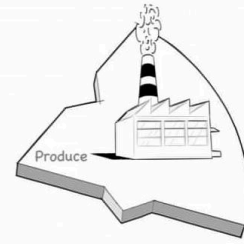
Notes

Summary



7m 26s

# Produce: Quality Assurance



- Quality Assurance
- Quality Control

Technology Innovation for Sustainable Development

We'll now discuss quality assurance, which is essentially the way industries prevent mistakes or defects in manufacturing products and avoid problems when delivering solutions or services to the customers. Quality assurance and quality control are two very closely related concepts and because of that close relationship they are often confused and one is inappropriately used as a substitute for the other. Quality assurance is essentially a system that is put in place before operations begin ideally. In order to ensure that the steps of the various processes will be done in the correct way, including mechanisms to prevent mistakes and defects. If the system is designed properly or correctly, then there is a high level of assurance that the desired results will turn out as expected. Whereas quality control is a series of tests at various stages during the manufacturing process that verify that the expected outcome at each stage, as specified in the quality assurance system, has been obtained for each resulting product. If the correct controls are in place then you have high certainty that all the final products are good, because they have each passed all the quality control tests.

Notes

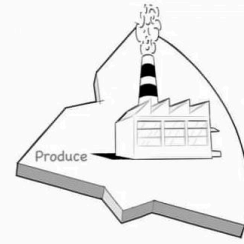
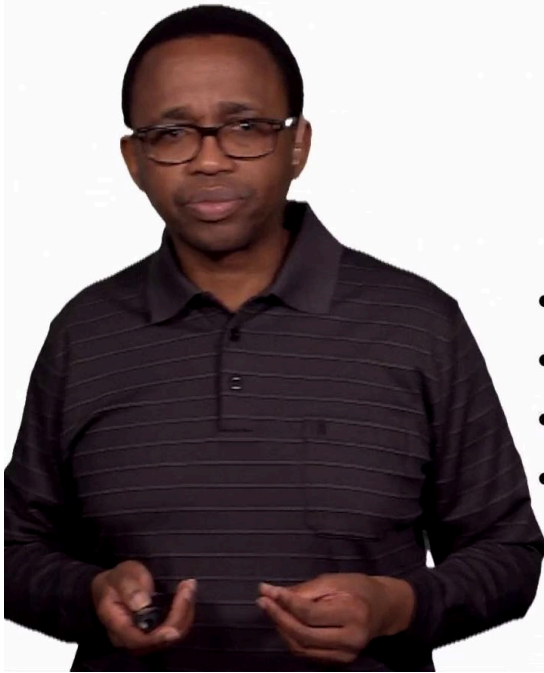
Summary



8m 40s



# Produce: Quality Assurance



- Quality Assurance
- Quality Control
- QA: ISO 9000
- Pharmaceuticals: GMP, GLP, GCP

Technology Innovation for Sustainable Development

One of the most well known quality assurance standards is the ISO 9000 that was first published in 1987. and has since then been widely adopted world over. Apart from this general standard most industries have their specific standards that in many sectors will be mandatory for your product to be allowed and sold on the market. For example, the quality assurance system appropriate to the manufacturer of pharmaceutical products would involve guidelines such as good manufacturing practice or GMP, and other associated codes, such as good laboratory practice and good clinical practice, or GCP.

Notes

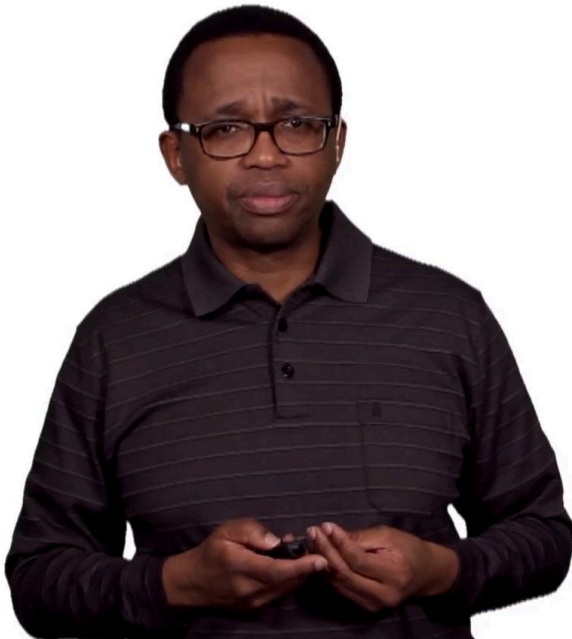
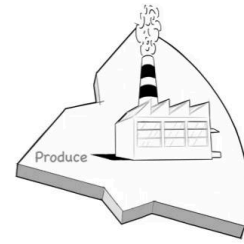
Summary



10m 10s



# Produce: Final Word



- Time is Money:  
Choose you Battles Well

Technology Innovation for Sustainable Development

As a final word it is important to think about some of the issues discussed in this lecture as early as you can for example, if you can figure out very early on that to obtain your product you need to only manufacture one component in the end and the rest you can obtain in the market, then you can simply focus your R&D on the most crucial part instead of trying to build the whole system. This would save you precious time and resources. Goodbye.

Notes

Summary



10m 59s