

Product Engineering and Design Thinking
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Module - 08
Industrial Design, Design Entrepreneurship and Design Thinking
Lecture - 40
Product Engineering'- led Technology Entrepreneurship

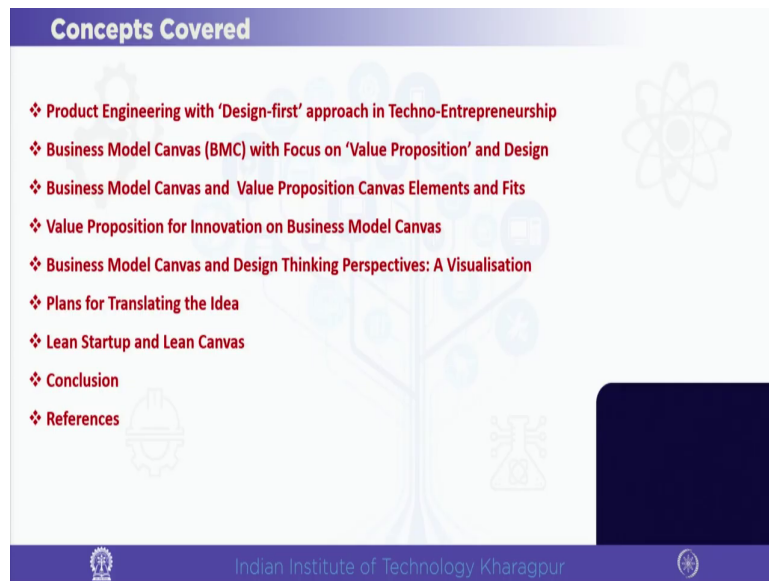
Welcome back to and today we would be having the concluding session of the course on Product Engineering and Design Thinking. Interestingly, whatever we have done so far in product engineering, design thinking, design driven innovation and all related things, finally, we will culminate into its ultimate application or implementation. As you know that apart from the jobs in corporate progression, which this kind of things will be of great help.

But the current milieu is encouraging and opportunities being created in entrepreneurship. And of course, of course, not so many jobs are also available in the country or anywhere. So, therefore, it was an imperative to discuss how this knowledge that we have gained can be used to create a venture and to go for a startup and what are the tools and methodologies involved in this.

But I would like to tell you that though I am talking about startup, but one thing this knowledge of the entire thing would be useful if one is not even doing his or her own startup, but are working, but are interested in working in new startup companies. Then also this knowledge will be immensely valuable and that is what is the focus of today's discussion.

So, here it is more of a career oriented discussion of course, with academic discussions including tools, methodology's techniques. And so, I am sure this will open up a new vista for you, the those who are particularly the fresher's, young graduates and recent graduates who are interested using this kind of knowledge for your career advancement.

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So, as I have already told you what this course will contain, I am just going into the detail of saying that basically we will be discussing the tools and methodologies and techniques, how this entrepreneurship venture using product engineering and design can be done properly, perfectly and effectively and usefully.

So, here we would be talking about the tools, methodology, steps like say for we will be eh exploring the value proposition map that when we are saying design or product; that means, we are creating value, value is to be only if customers would actually look into your product, the value that one is looking for or searching for and how it fits in the overall business model that also we would see. So, we would be discussing the business model canvas and it is the value proposition canvas which is actually superimposed in it.

And then we will discuss the various methodologies of a involving or the steps involving the a value proposition concepts, implementation steps. And how the lean startups can be made where, with minimal resources without wasting time very quickly one can launch etcetera. And so, we will be talking about those tools including the lean canvas which is more entrepreneur centric.

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Product Engineering with 'Design-first' approach in Techno-Entrepreneurship

- ❖ Product Engineering supports systematically creating innovative products that can penetrate a sluggish market with fascinating offerings, allowing businesses to be sustainable, with 'innovation' at its core.
- ❖ It sustains innovation, by focusing consistently on feeding the market with quality products and disruptive innovations to drive growth.
- ❖ Design, the discipline of solving problems, waxes distinct competitive advantages, and the process can be applied to a technology venture.
- ❖ Every wing of the business is meant to solve certain problems for individuals concerning products or services and in doing so the design oriented (design-driven or HCD Centric Design Thinking) businesses financially tower above others.

- 30% have a designer founder
- 85% have founders/ top-execs address design decisions
- 87% believe 'design' is rather important
- all agree that 'design' matters

According to a recent survey, in start-ups <http://2016.futureof.design/>



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So, we just go into the topic that we intend to discuss today and here we start with the you know saying that how the design is facilitating the companies and how it is being perceived by startups.

Today our focus will be startups that is either your you know prospect in launching your own startup or in a startup based company. Or in fact, I will tell you earlier also I had mentioned

that if you can have this kind of attitude, mentality, knowledge, skills the same would be very much appreciated now in modern times in corporate organizations as entrepreneurs.

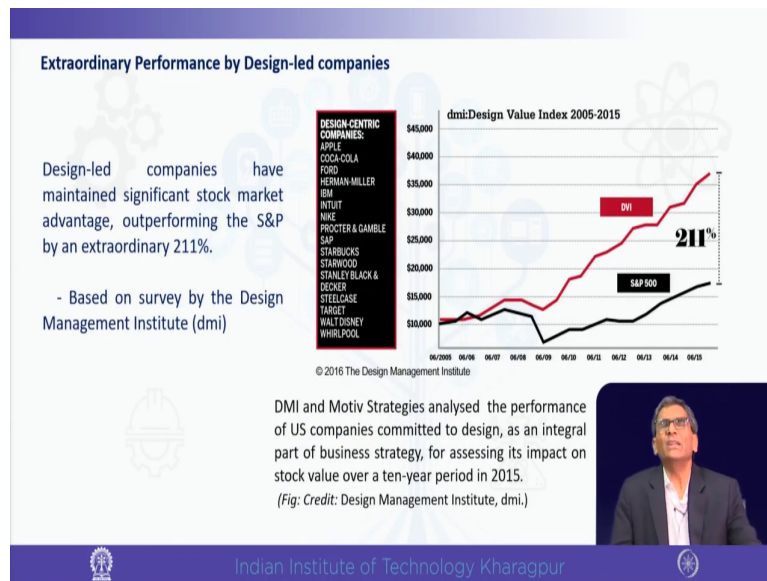
Now, because corporates are now looking for people with this kind of entrepreneurial attitude, which are and they call it entrepreneurs and with that idea let us go into and learn what the startups has to see about particularly focused on design. You can see it is mentioned that 30 percent are of a design founders from a survey of 2016, the reference is provided here.

And 85 percent have founders or top executives address design decisions 87 percent believe design is rather important and all agree that design matters. So, having said that we will go into our core discussion that product engineers engineering supports systematically creating innovative products. That can go into the not so, moving markets yet create you know innovation and allow the business to be sustainable.

And the focus is consistently to deliver innovative newly developed products into the market and create disruption that those are disruptive innovation and that drives growth. Design as a discipline, smooths things or waxes distinct competitive advantages and the process can be applied to technology ventures.

So, every wing of the business is meant to solve some problem and individuals concerning products or services and in doing so, the design oriented approach be it design thinking oriented or be it design driven oriented be that as it may this. We would see that those who are using the design focused strategies they are doing better that towers they are financially tower over others.

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And that we can see very quickly we would see because we do not have to go into detail of this discussion, but we can see that those who each companies you can see the studied later on it is in the slide, but my objective is not to give you the exact percentage these are that, but to show you that those companies, which are design focused or rather having given design as an important place in the business strategy.

Their stock market values in the market has gone up hugely and say more than 200 percent that you can see and the reference is given from the Design Management Institute has published this.

And there are certain names of the companies also that you can study later that it is not to go into the company details or not to go year on year that is 2005 to 2015, but the question is that

here you see that those who are adopting they are doing better that is the objective. So, that is an; that is an I would say motivation and that is the inspiration.

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Business Model Canvas (BMC)

- ❖ BMC is comprised of **four major parts**, having the **key piece at the middle** of the 'Canvas', depicting what the enterprise is doing (offering) and why does it matter to potential customers and is called '**Value Proposition**'.
- ❖ The **right part**, of the one-page Canvas, deals with the **customer-related aspects**, in three sections; (i) who they are, (ii) what relationship the venture has with them and (iii) how will the enterprise reach them.
- ❖ The **left part, of the Canvas** deals with creating ideas and plans for translation, in three sections, concerning (i) what key partners would the venture need, (ii) what activities and (iii) what resources would the venture require to give shape to the new concept.
- ❖ **Bottom part of the canvas** deals with most decisive financial questions in two sections (i) how much will be the cost to produce accordant to select idea and (ii) how will the business make money (Revenue/ Profit) from it.

In the context of a new business, it is aimed to bring better clarity with the use of a tool, known as 'Business Model Canvas (BMC)', proposed by Alexander Osterwalder, which is a flexible design-delving template containing nine sections.

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So, with this we go into the tools as I said that how actually this can be a hub placed one very common thing in business technology or in business or other businesses is that business model canvas. Because ultimately if a startup is a business and so, we would start with the business model canvas and business model canvas actually it talks about a the in one page in one screen how you can visualize the entire business.

So, how can that be? So, basically one is the most important part is the value proportion or the offering that you are making or one part would be the customer who would be taking that, which is the right part of the canvas, stating who they are what relationship the venture has with them and how will they enterprise reach them that is the that is the customer part.

There is another part which is called the you know partner part with whom we would be associating to deliver that. It may be the suppliers, it may be the consultants, it may be whatever resources what are the resources required for this that is the how we are going to build and give it to that. So, that is on the left part of the canvas and which is the key partners part involves what activities are required, what resources are required, what key partners would be needed etcetera.

And so, we have talked about 3, that is one is that what is the what we are going to do the product or service which is called value proposition. And then the right part is the customer left one is the supplier or key partners and finally, what happens in a business ultimately it has to; it has to survive on profit.

So, at the bottom it is the bottom part comprises of two things one is the revenue stream and the cost structure which is the ultimate the performance with so much of things. So, here how much will they cost of produce cost of producing the goods and how much a revenue it will earn and finally, from that what profit will be made. So, a Business Model Canvas proposed by Alex or Alexander Osterwalder as you know proposed this and we are going to discuss that in a bit more detail.


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Business Model Canvas

Key Partners	Key Activities	Value Propositions	Customer Relationships	Customer Segments
	Key Resources		Channels	
Cost Structure		Revenue Streams		


- **Value Propositions:** resultant from the 'products/ services' that create value for a customer segment.
- **Revenue Streams:** capturing value for the business at price customers will pay.
- **Cost Structure:** presents all costs 'incurred' to operate a business model.
- **Customer Segments:** groups of people/ organizations the business aims to reach
- **Channels:** how the 'value proposition' is reached through communication, distribution, and sales Channels.
- **Customer Relationships:** acquiring and retaining customers; context of closer involvement for customised products.
- **Key Resources:** are the most important assets required to offer and deliver the 'value proposition: Product and service'
- **Key Activities:** are the most important activities a business needs to perform satisfactorily.
- **Key Partnerships:** describes the network of suppliers and partners that suffuse external resources and activities.

Profit: Comes from the difference between the 'Total Cost' in the Cost Structure and the total Revenue.





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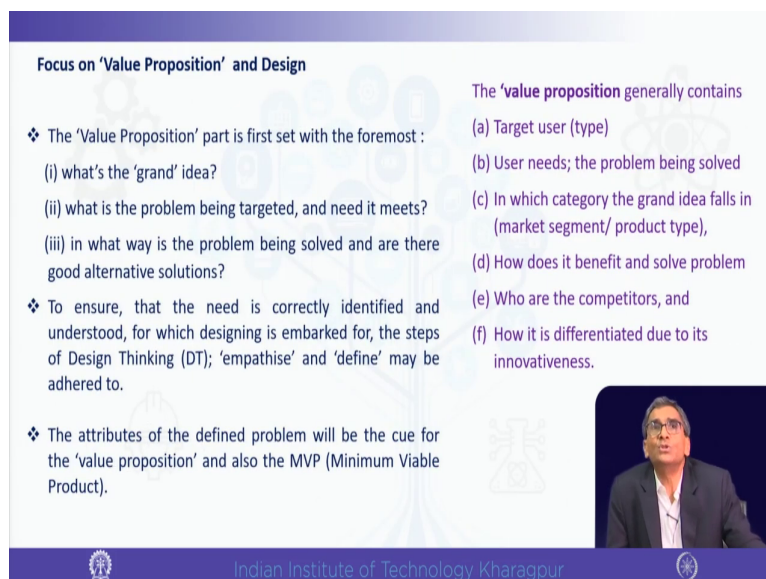
So, that we can see here four blocks as I just explained. It actually has got nine sections practically as you have seen in the last discussion here, I go back to the last discussion. Here you would find that first one, the value proposition is one section and then the right part has three sections the left part has three sections and the bottom part has two sections. So, in all it is nine sections

So, here all the nine sections are explained and this is the you know kind of a template which shows all these nine parts. Of course, the you know letters are small here purposefully because we wanted to keep it into one page, but if you zoom in you will see, but even if you zoom subsequent slides will actually show you how I mean those are you know presented in a bigger format bigger template format.

So, you can see on the right most is the customer segment on there after you know there are two things one the customer relationship and channel in the customer part. Similarly, on the left side is a key partners and these are other two that key activities and key resources and they are the center as I said is a value proposition and the bottom left is a cost structure and bottom right is a revenue stream, which is already mentioned here.

And of course, we know that profit is the difference between the a revenue one and the cost structure. So, in one a page we get the entire view of the business. Now, when we are saying that our focus here as product engineers, product managers to focus on the how actually the whole thing is going to material is it moves around the central part, which is the value proposition what value which is all the businesses will ultimately materialize be successful. Only if we are offering the right value the right product.

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Focus on 'Value Proposition' and Design

- ❖ The 'Value Proposition' part is first set with the foremost :
 - (i) what's the 'grand' idea?
 - (ii) what is the problem being targeted, and need it meets?
 - (iii) in what way is the problem being solved and are there good alternative solutions?
- ❖ To ensure, that the need is correctly identified and understood, for which designing is embarked for, the steps of Design Thinking (DT); 'empathise' and 'define' may be adhered to.
- ❖ The attributes of the defined problem will be the cue for the 'value proposition' and also the MVP (Minimum Viable Product).

The 'value proposition' generally contains

- (a) Target user (type)
- (b) User needs; the problem being solved
- (c) In which category the grand idea falls in (market segment/ product type),
- (d) How does it benefit and solve problem
- (e) Who are the competitors, and
- (f) How it is differentiated due to its innovativeness.

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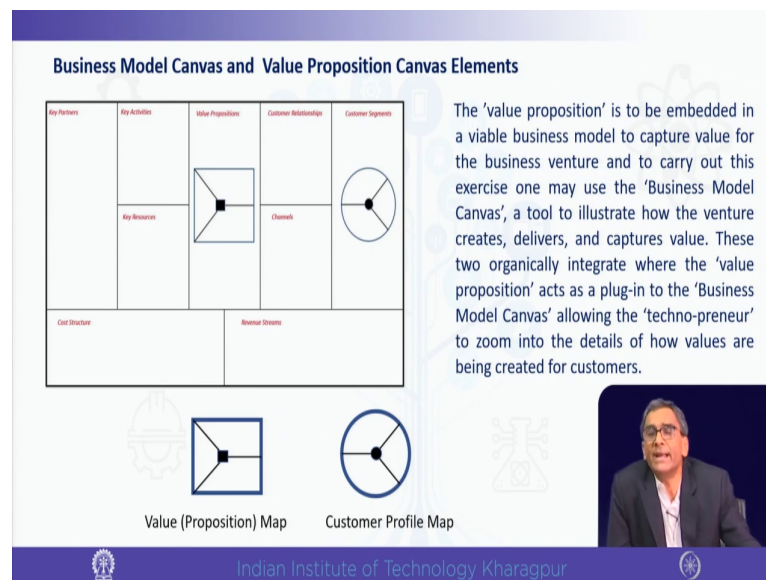
So, here what we do is we discuss on the value proposition which is the part is the first set of with foremost what is the grand idea. So, what it what is the value proposition? So, we have to talk value proposition is the idea? What is the problem being targeted I mean what problem will be solved and the needs of the customer to be met, in what way is the problem being solved and there are good alternative solutions?

But if there are not good solutions and if we are creating something meaningful and solving that problem with a grand idea then that is our value proposition. Alright to ensure that the need is to correctly identify need is correctly identified and understood for which the designing is embarked for the steps of design thinking empathize and define may be adhered to.

So, here to understand the how it is solving their problem what is the problem now you recall we can connect it to our earlier discussion of design thinking where the understanding of problem becomes clearer. So, the attributes of the defined problem will be the queue for the value proposition and to develop the MVP or the Minimum Viable Product to which we can test whether our value proposition is right we have to test with the customer.

So, what the value proposition really contains target user what is the type of target user who are they user needs the problems particularly that is being solved. In which category the grand idea falls in which market segment or product type how does it benefit and solve problem who are the competitors and how it is differentiated due to its innovativeness. So, these are the you know theme of value proposition.

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Now, we would see how the value proposition can be embedded in its a value proposition is a thing that we are creating the product now how that product that we are creating is affecting the business or in the business model that is being presented through this diagram where, now you recall the earlier business model template that I had shown.

Now, on that I have superimposed these two things one is that the two elements two major elements of value proposition one is that value proposition map or value map in short and other is the customer profile or customer map. So, these are the two things which are placed on big business model canvas. You can see that the customer profile is of the customer segment and the value proposition map is under value proposition.

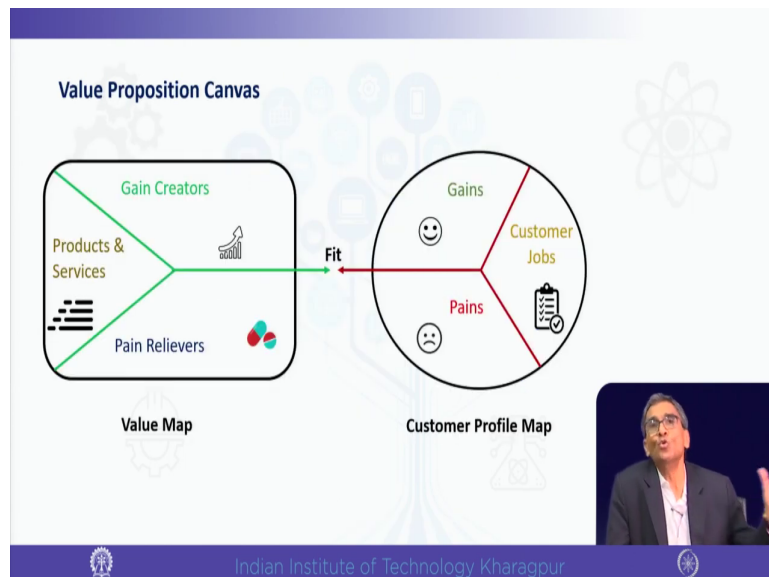
So, it very clearly states the you know the you know it is synchronization and fitment. So, the value proposition is to be embedded here as I have already said and. So, value proposition

here acts as a plug in that this is the business model, we plug in the value proposition and see how it affects and that allowing the technopreneur to zoom into the details of how values are being created for customers.

So, that the business model ultimately successful so, unless we dissect unless we go into the value proposition the correct value proposition will not be offered, correct product will not be offered. And then therefore, correct business model will or effective or successful business model will not be ready and which ultimately will not work if the value proposition is not perfect or done well.

So, and as you know as I have told you business model canvas a tool to illustrate how the venture creates delivers and captures value. So, how it does that all that and with that value proposition you know logically comes in.

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Then we zoom in onto the value proposition canvas as I said that it has got two broad elements that one the customer profile map another is a value map or value proposition map. Now, the value and the customer profile map will have the customer jobs that is jobs to be done. The customer wants certain jobs to be accomplished using that product any product any service or any system.

And the customer also has certain pains which you know needs to be attended to and solve the need basically. And also, the customer wants certain gains that ok if that is there in the product then it would help. Now, in our offerings we as we are creating value in the value proposition or value map. So, we have to see those three things are being met.

So, what we are doing is that customer jobs for that we have to create certain products and services and that to address those pains there has to be some pain relievers that which alleviates or removes the pain and gain care gain creators, which actually are contributing to the gain.

Now, the alignment of this two is giving the fit best fit. This fit is the first fit or we can simply be calling it problem solution fit. The customer side is the problem value map is the side of solution. So, if there is a correct problem solution fit then this is valid item, which we can take it forward.

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Value Proposition Design aids in

- ❖ Gaining clarity on the patterns of value creation by way of organizing information regarding customers need (jobs to be done, pains, and gains)
- ❖ Getting the venture-team aligned for leveraging the experience, skills and energy with shared language in creating value for the customers and business.
- ❖ Reducing the risks of failure and saving time by painstakingly testing the important hypotheses intrinsic to the product/ venture ideas.
- ❑ Overriding purpose is to Design, test, and deliver to meet the needs of the customers precisely
- ❑ Product Engineering team resorts to 'Value Proposition Canvas' a tool, apt for this purpose.

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So, now so, a value proposition design aids in gaining clarity on the patterns of the value creation by the way of organizing information regarding customer's need jobs to be done pains and gains I have already said that. Getting the venture team aligned for leveraging the experience, skills and energy with shared language in creating value for the customer's and business.

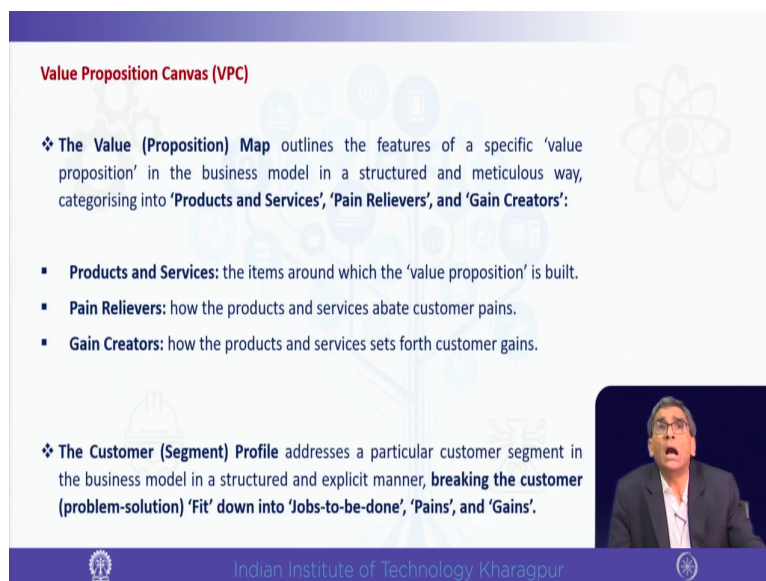
And of course, reducing the risk of failure and saving time by pains taking rigorously, relentlessly testing the important hypothesis intrinsic to the product or venture ideas. So, finally, the overriding idea is to do you know the design test and deliver to meet the needs of the customer.

So, a value proposition canvas a tool act for this purpose. So, design test and deliver these are the activities through which the needs of the customer is being made. So, we should keep in

mind that in our discourse so far what we had, our focus was product engineering, design, testing and finally, this has been delivered.

So, with this knowledge input skills whatever we have so far, we can simply use it for creating new products and go for new business or help a startup setting up its new business or a new business can where the person can be employed as a very important resource person.

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Value Proposition Canvas (VPC)

❖ **The Value (Proposition) Map** outlines the features of a specific 'value proposition' in the business model in a structured and meticulous way, categorising into '**Products and Services**', '**Pain Relievers**', and '**Gain Creators**':

- **Products and Services:** the items around which the 'value proposition' is built.
- **Pain Relievers:** how the products and services abate customer pains.
- **Gain Creators:** how the products and services sets forth customer gains.

❖ **The Customer (Segment) Profile** addresses a particular customer segment in the business model in a structured and explicit manner, **breaking the customer (problem-solution) 'Fit'** down into '**Jobs-to-be-done**', '**Pains**', and '**Gains**'.

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So, the canvas we have already mentioned value proposition canvas we have seen that a it is categorized as you know products and services, pain relievers and gain creators we have already seen that.

Now, products and services the items around which the value proposition is built that is the value proposition how it is being offered, how it is being given, if it is a food, if it is a

refrigerator, if it is a air condition. So, how the value, to a say the cooling of a person is the value and that is being given by the air conditioner.

Hunger is the you know need that is being fulfilled with the food. So, the product right him actually is creating the around which the value proposition is being built. Pain relievers so, how it abates the customer pain. Gain creators I mean how it creates the customer gains or say in some case it is delightment excitement.

So, the customer segment profile as I have said addresses a particular customer segment in the business model in a structured and explicit manner, to breaking the customer or problem solution fit down into jobs-to-be-done, pains and gains. Now, I have used just now a word called fit. I have already used the word fit earlier when we talked about the value proposition map where the problem solution fit the first fit, we had discussed.

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'Customer 'Jobs', Pains and Gains

- **'Customer Jobs** ('Jobs-to-be-done') 'verbalises' what customers are trying to get done in their context.
- **'Pains'** characterise awful outcomes, risks (undesired potential outcomes), and obstacles pertained to customer jobs
 - Pain severity can be extreme or moderate perceived by a customer, like 'customer jobs' can be important or insignificant.
- **'Gains'** illustrate the outcomes desired to be achieved or the concrete benefits sought by the customer.

Customer 'Jobs' are mainly three types

- ❑ **Functional jobs:** When customers try to accomplish a specific task or solve a particular problem (example: grind spices or save contact in mobile phone)
- ❑ **Social jobs:** When customers crave to look good or gain status/ power (example: to look classy as a consumer or be perceived as tech-savvy)
- ❑ **Personal/emotional jobs:** When customers quest after a specific emotional state, such as feeling good or secure (example: achieving the feeling of safety in using a gas-oven or peace of mind with smoke-alarm).

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Now, here a quickly we would go to this a bit elaboration, but it will be on this thing I will not go the detail of it because it is self-explanatory and we can understand customer jobs, their jobs to be done that says what exactly they are trying to do. Pains; that means, the characterizes the awful outcomes risks which is undesired potential outcomes. Pain severity can be extreme or may be moderate.

Like customer jobs can be important or insignificant. Category is their extent is there. So, all are not equally important we have to see particularly though to address first, which are most important and best fit would be when we can find out prioritize the most important things and then work out a value provision around it.

So, similarly the gains illustrate the outcomes desired to be achieved or the concrete benefits shot by the customer. Now, very briefly I would say that the customer jobs as I said jobs to be done etcetera are of three types one is that, say there are three types of jobs to be done. Usually mainly one is the functional jobs something that is to be done for a scissor, which cuts paper or say a mixer which grinds spices or say contact in mobile phone that is the purpose.

So, it functional jobs social jobs is when someone is craving for to look good or gain status or power say for example, someone is buying a car which gives a social status or power or say a buying trendy dresses or say classy dresses or be perceived as tech savvy person with modern electronic gadgets. So, that is the social means and therefore, the social jobs it has to perform and finally, personal and emotional jobs that also the product will have to perform.

Say for example, here if someone is using a gas oven. So, that it gives a piece of mind or safety. Similarly, one is booking a night taxi whether it is safe etcetera. So, all these are actually bundled in the value proposition and which are the customer jobs. So, customer jobs just may not be an item per say, but it has also the other aspects that it is a social connotation it has emotional or personal connotation.

So, we cannot dissociate these factors from the product that we must keep in mind. But because why I am saying that when we will design that product, we have to keep those aspects in mind how it is going to be of help.

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Customer Gains

- **Required gains:** are those without which a solution wouldn't work (example: **the most basic expectation** that one can make a **call with a smartphone**).
- **Expected gains:** are rather basic which one **commonly would expect from a solution**, even if it could work without them (example: since Tesla introduced electric vehicle, the usual expectation **would nicely-designed and look stylish**)
- **Desired gains:** are those that go **beyond what one expects from a solution but would love** to have it if possible and usually customers would verbalise if queried (example: **Laptop computer to be seamlessly integrated with customer's other devices**)
- **Unexpected gains:** are those that go **beyond customer expectations/ desires (surprise)** and they wouldn't verbalise if queried (example: Before the introduction of **touch screens by 'Apple'** customers hardly thought of it as part of a phone).

With reference to 'Gain', a customer may perceive something **essential or nice to have**
the way for 'pains' it is 'extreme' or moderate.

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Well, regarding a customer gains would say there are certain kind of gains which people know that they are there they are facing when without that it cannot work. And it is something are quite expected that ok that everywhere is this company is giving. So, it will give that kind of a thing. Say for example, the there are four types of such gains required gains, expected gains, desired gains and unexpected gains, which are actually surprises.

Say for example, required gains is when absolutely basic say for example, call with a smartphone that one can call with a smartphone that is basic that is a required gain. I mean without that it will not work simply. Expected gains is that when you know that Tesla is

producing say for example, an electric vehicle, they are making it very stylish and nice looking etcetera nicely designed. So, obviously, that is expected gains when you are by that you will automatically get that.

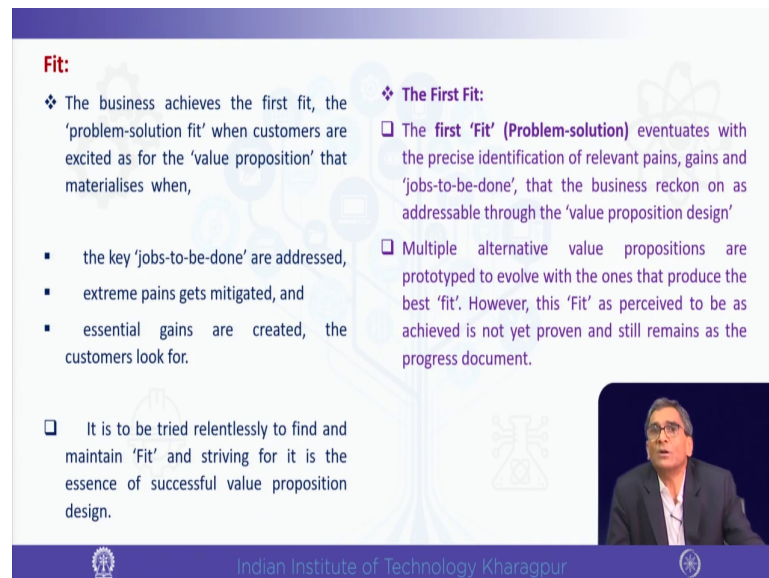
Desired gains which are that normally that that go beyond what expects from the solution, but would love to have that, say for example, if I have a mobile phone or a laptop that is that can be seamlessly integrated with other devices, ok. So, that is the desired gains. Last, but not the least is the unexpected gains and that is the delighter. Perhaps now you would recall our discussion of the Kano model that we had discussed earlier, that the unexpected gains that go beyond customer expectations.

And for example, Apple's touch screen now people know touch screens, but when touch screen was not there Apple brought it. So, it was something very unexpected due to surprises something absolutely new that came. And interestingly this desired gains for example, if you ask people to verbalize that ok, do you have any desire or something can be done perhaps they, but then for unexpected gains hardly customers would be able to say what more is required.

And so, here there are many examples I had given the examples of iPod earlier also. So, there are many such and again here as I said the in terms of gain there are two types one is that something, which is essential or something is nice to have. Essentially, it means the problem is hair on fire, but which is urgent which is important without that it cannot work and something is nice to have ok, fine if it is there it is very nice.

Similarly, as I said that similarly was for pains which was either extreme or moderate here it is essentially or nice, but to be successful I will tell you in you know a new product creation is a focus should be on essential or hair on fire kind of a problem that nice to have. Because essential problem essential problems will always have a market and the chance of being successful is there. So, largely that is the; that is the advice.

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Fit:

- ❖ The business achieves the first fit, the 'problem-solution fit' when customers are excited as for the 'value proposition' that materialises when,
 - the key 'jobs-to-be-done' are addressed,
 - extreme pains gets mitigated, and
 - essential gains are created, the customers look for.
- ❑ It is to be tried relentlessly to find and maintain 'Fit' and striving for it is the essence of successful value proposition design.

The First Fit:

- ❑ The first 'Fit' (Problem-solution) eventuates with the precise identification of relevant pains, gains and 'jobs-to-be-done', that the business reckon on as addressable through the 'value proposition design'
- ❑ Multiple alternative value propositions are prototyped to evolve with the ones that produce the best 'fit'. However, this 'Fit' as perceived to be as achieved is not yet proven and still remains as the progress document.

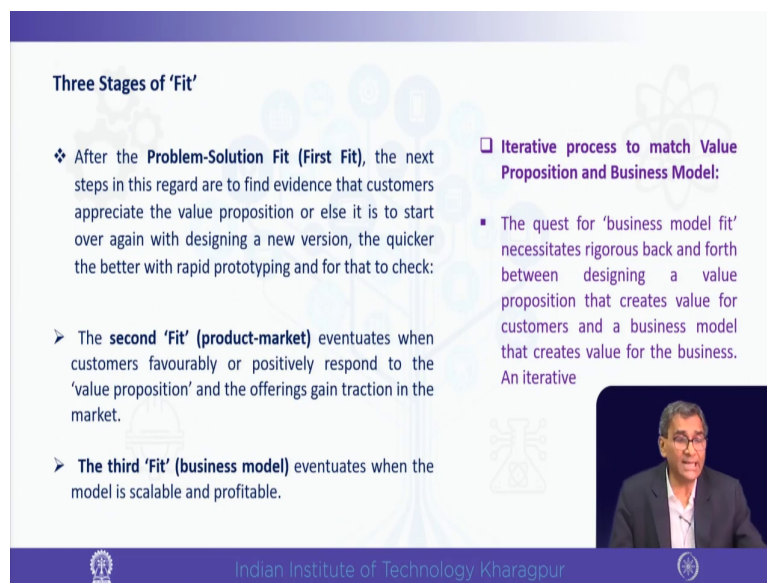
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Now, we come to a consideration of feet one feet I have already discussed is that the you know problem solution fit through value proposition canvas already we have discussed that. And then which is the you know the first fit the problem solution fit as I have said. And the and in that the thing is that the key is the key job is to be done to be addressed, pains and gains to be mitigated and essential gains are created that the customers look for.

So, it is to be tried relentlessly consistently to find and maintain fit and fit is and striving for it is the essence of successful value proposition continuous lot many iterations. So, the best value proposition is to come out. So, as I have said that first fit is the you know problem solution fit that deals with the you know jobs-to-be-done that the business reckon on as addressable through the value proposition design.

A multiple alternative value propositions are prototype to see which one evolves as the best one and the best fit this fit is perceived to be as achieved is not yet proven though, but the fit that is on paper that value proposition fit means it is on paper that ok if we do that the customer would like that etcetera, but actually people have not paid yet to buy that. So, this is a first fit that is why we say that the problem solution fit, but that is the first important fit that which is essential without that we cannot go to any other fit.

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Three Stages of 'Fit'

- ❖ After the **Problem-Solution Fit (First Fit)**, the next steps in this regard are to find evidence that customers appreciate the value proposition or else it is to start over again with designing a new version, the quicker the better with rapid prototyping and for that to check:
 - The **second 'Fit' (product-market)** eventuates when customers favourably or positively respond to the 'value proposition' and the offerings gain traction in the market.
 - The **third 'Fit' (business model)** eventuates when the model is scalable and profitable.
- ❑ **Iterative process to match Value Proposition and Business Model:**
 - The quest for 'business model fit' necessitates rigorous back and forth between designing a value proposition that creates value for customers and a business model that creates value for the business. An iterative

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So, but then the what are the other stages of fit the after the problem solution fit which is the first fit as I said. The next steps in this regard to find evidence as I said the customer are willing to buy and pay for it.

So, or else we have to again start redesigning if the customers are not buying. So, it is an iterative process altogether. So, and this is a process to do new versions quicker the better and

for that rapid prototyping council. We have talked about rapid prototype in one of our earlier lectures.

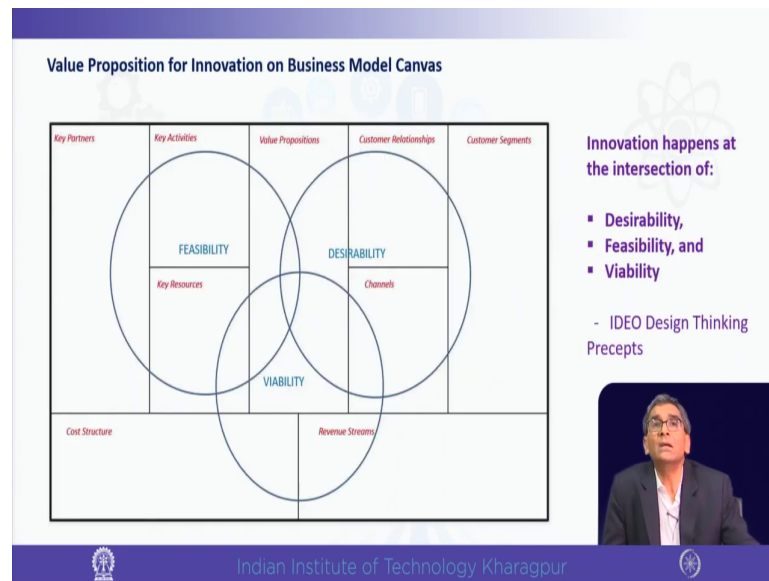
And so, here with the help of rapid prototyping we should try and quickly come to a thing called with MVP the problem solution fit. The second fit as I said when people are ready to buy that eventuates when customers favorably or positively respond to the value proposition and the offerings gain traction in the market.

Then actually the it is understood that its product market fit has happened; that means, people are ready to pay. And the last fit is when actually it is the business model fit; that means, when this is being this are becoming scalable that if you produce more there will be more sales and that will be more profit; that means, market has completely taken it up. So, business model fit is the most important thing.

So, iterative process to do the value proposition and business model are constant. The quest for business model fit necessitates rigorous back and forth between designing a value proposition that creates value for customers and a business model that creates value for the business as iterative. So, business model is getting value for the business the value proposition is creating the value for the customer.

Because value for the business will never come, we cannot come without creating value for the customer. So, by creating value for the customer only we can survive and create value for the business. So, this matching and iterative models between these two are absolutely important.

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Now, just you see that just we have superimposed that our consideration of the innovation concept, which we are applying in the value proposition that is you remember that in design thinking we discussed the innovation happens at the intersection of a desirability, feasibility and viability.

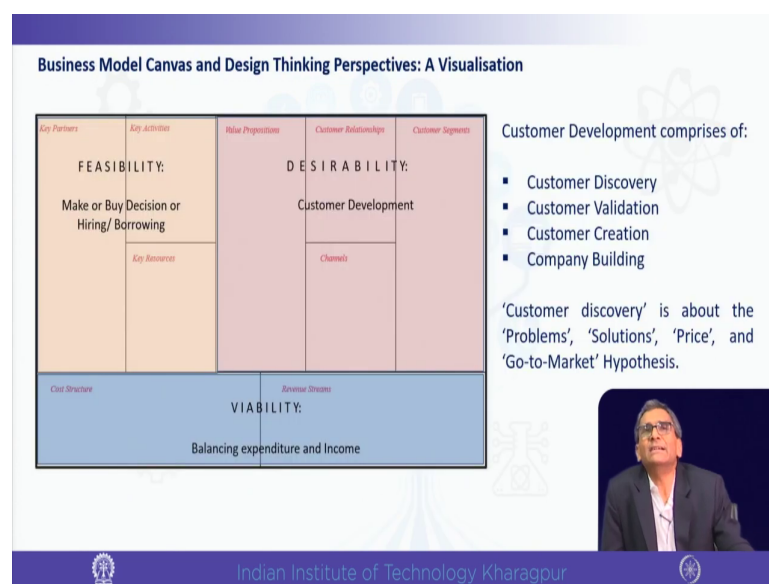
Desirability when the customers like it feasibility when it can be translated economically and effectively and technologically correctly, viability is when it actually can produce revenue and income and profit. So, these three only when it meets the innovation actual character you know innovation comes, sustainability innovation comes.

And this therefore, design thinking model of idea is superimposed to show that this is desirability actually is connected between the value proposition and the customer. And there the desirability comes; desirability is connected to the customer.

Similarly, the feasibility is connected with the you know production system whether it can be made how economically it can be made, technically can be made. So, it is the key partner key activities, key resources etcetera. And finally, the viability comes from the you know cost and revenue.

So, these three are now you can see superimposed on the business model. So, business model and design thinking are innovation together are being you know visualized in one template, one diagram, which gives us the clear view of what we are aiming at.

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And this is just another version of it. Now, instead of this thing we have musted to give it a better clarification. So, the desirability on the left side these three blocks the fourth blocks and the customer related three blocks and the value proposition the fourth blocks. So, four blocks and the feasibility is those three blocks which is the you know the a key activities, key resources and key partners.

So, and the viability of course, the two which is referred. So, the desirability is the customer development, feasibility is to also check a the whether it can be made in house or it is to be bought or make or buy decision, which is very commonly called either you make it in house whether you have the capability to make it in house.

If you do not have capability one has to buy from outside or hire the you know service or borrow. So, that you know it can be created. So, that is how technically it can be made feasible. Economically it how it can be made viable? So, technical feasibility and economy and viability both are required and peoples or customer desirability is the other part.

Now, the customer development as we say it has eh it actually has four steps one is the customer discovery, customer validation, customer creation and company building. We will not go into the detail we know broadly what it would be, but at for us at this stage we need not go because it is not that discussion our focus is on how we are going to do the value proposition in business model.

Those customer validation etcetera we will discovery etcetera we have discussed partly when we discussed MVP how we take the views of the customer where it is important just to know that customer discovery, which is important in MVP is about the problems whether we have selected right problem, whether you have selected the solution or whether the price that we are thinking is right and whether go to the market strategy is right.

So, these are the four hypothesis those are to be checked with the MVP. So, here the last point is important customer discovery is about problems, solutions, price and go to market hypothesis. Here we have discussed that. And so, we have come to come back to this.

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❖ 'Plans for Translating the Idea':

- ❖ Looking at the left part in BMC, it is intended to appraise about (a) what resources, (b) activities and (c) partners would the venture need to actually launch the product.
- The major question is whether the co-founders themselves are able to build the product or will it need to hire people for doing it in-house or to off-load the development or manufacturing work to other firms. They are called 'key partners'.
- A 'stakeholder mapping' is usually handy in this process and an example-diagram provides an illustration of its tenets.

FIG. Stakeholder mapping

□ An elaborate discussion on preparing 'Stakeholder Mapping' has been kept outside the scope of present discussion keeping the objective of the present discourse in view, which eventually, is to create the prototype of the 'grand idea'.

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Now, in terms of translating the idea this is an a thing which we need not go into details now, but why I have kept it? Because maybe when you are translating one may try to find out what is the relationship say for example.

For certain products the customer and supply relationship has to be very strong the entrepreneur and customer relationship has to be very strong like say if it is a customized product every time a new product comes up or something then the customer has to be involved and co-creation happens.

So, that is the relationship, but first other standard products it may not be so, important. So, what are the resources required, what are the partners that we have discussed the major

question is whether the co-founder themselves are able to build it, we have also discussed that in translating a stakeholder (Refer Time: 40:38)

Then how whether one is a person is making the which party the supply is making what is the relationship what kind of relationship we are making whether it would be in cross close proximity or whether it would be within the company or it would be brought through certain transportation method all these are the you know the relationship thing and which is and they are the stakeholders. So, if we can map them and as I have mentioned here very clearly no elaborate discussion here on stakeholder mapping is necessary.

But I have presented this in case you want to do a sketching just rough sketching you do not have to be exactly follow this, but a rough sketch as to how one is connected to this thing if the customer is very close related in this particular kind of thing if the particular suppliers are related then that will be of help that is the purpose. One does not have to study that right now in great detail unless it is necessary, but I am presenting if in case during practice it comes up you know what to go and where to go.


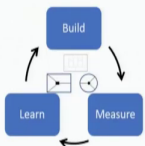
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Lean Startup

- In the early stage, a prototype is often in the form of a 'Minimum Viable Product (MVP)', which is the embodiment of the 'Idea' to obtain quick feedback from the early customers and several iterations of it may have to be undertaken to meet the need.
- The crucial task, is to create tangible/ physical model only with the core features so that functioning and characteristics of product can be verified.
- The product engineering team/ startup would aspire for as much input as possible quickly (where rapid prototyping comes in), and going back to the drawing board at the earliest with revisions, to improve it.
- Such feedback based revisions and testing of the prototype (MVP) may be required to be done multiple times.

Build-Measure-Learn (B-M-L) loop, Proposed by Eric Ries for 'Lean Startup' becomes quite useful here.

□ The B-M-L loop helps save money, time, and resources. By starting with a minimal version of the product, ventures can test it out in the market before making big investments in developing or producing. This allows to quickly identify potential issues before they become expensive mistakes.



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So, we would be just taking up our last kind of our discussion on the lean part the lean startup, which has been proposed by Eric Ries who have talked about as we were discussing MVP, but his suggestion his proportion is that it should be quickly you know prototype and the learning will come from that and he suggested business a build major learn or BML loop.

So, that you know the BML loop helps to do it quickly it saves money time and resources and by starting with a minimal version that is the MVP where the only the core features may be tested. And before some big investments are made to allow quickly identify potential issues before they become expensive mistakes.

So, quickly if we can see and therefore, we can save ourselves from committing mistakes and we have talked about the MVP and earlier also the crucial task is to create a tangible or

physical model only with the core features. So, that the functioning and characteristics of the product can be verified that is the purpose.

The product engineering team or startup would aspire for as much as input as possible quickly as I said quickly otherwise time and money will be wasted. And as I also earlier had said rapid prototype becomes in very handy and if it is involved then we can quickly go back to the drawing board and try and improve with revisions.


And such feedback based revisions and testing of the prototype may be required for multiple times. But then so, be it multiple times is fine because before committing to a large scale production system and failing is not a very desirable option.

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Lean Canvas: Entrepreneur's Perspectives focused on Product Engineering and Design with Unfair Advantages

Problems Listing of top-three customer problems 2	Solutions Present possible solutions for each problem 4	Unique Value Proposition Single, clear compelling message that transforms a visitor into an interested prospect 3	Unfair Advantages That can't be easily copied (Entry barrier) 9	Customer Segments Listing the target customers and users 1
Existing Alternatives Listing of extant solutions to the problems 8	Key Metrics Listing key numbers referring to how the business is doing today 8	High Level Concept Listing the correspondence analogy (e.g. Xerox= Photocopying)	Channels List your path to customers	Early Adopters Listing characteristics of the ideal customer
Cost Structure Listing all the fixed and variable costs 7		Revenue Streams Listing all sources of revenue (with price) 6		

To examine the venture issues more from an entrepreneur's perspective, Ash Mourya has proposed a 'Lean Canvas' that focuses on the offerings with an emphasis on 'Unfair Advantages' (for Competitive Advantage)



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And here practically we are on the last leg we would say that here also a lean canvas has been proposed which is by Ash Mourya. It is similar to business model canvas, but here business model canvas is mainly from the outward look how the investors and others would be looking at the business, but here it is from the entrepreneurs perspective. How we have we can create unfair advantage that is competitive advantage unfair advantage means which is not available with others.

So, here we have on the left side problems and existing alternatives problems and existing solutions alternatives then solutions, how you are proposing the solutions there are existing solutions and what is your solution or our solution and what are the key metrics. How we measure that it is working or it will work and the central part remains unchanged that is unique value proposition here also.

And as I said there is a unfair advantage that is the most important thing that is the innovative that is the innovativeness what new are we creating that how we can put entry barrier that is unfair advantage means if we can do something where we can put entry barrier to the competitors potential competitors.

Then we have great mileage, which is which often done is through the patenting or using IP because if you create something new and new design new engineering or new technology then it can be patented. And once it is patented the others cannot copy it quickly so, that is very important.

So, rest are all similar customer segments and channels and particularly here we are talking about the early adopters because see here for any new product what is the customer for a new thing that comes in the market beat iPhone beat smartphone beat laptop beat anything or electric vehicle.

We have to find out where to enter they which is called beachhead that is ideal listing of ideal customers who are the early adopters not everybody would be taking in the first go. Slowly and slowly, it will pick up, but we have to identify them.

And the bottom is same to the business model canvas that is cost structure and revenue stream. Here so, this is important from the conversion side from the engineering side and from actually product creation side and from the entrepreneurs perspective. It has not something so much to do with the you know selling it to the you know investors, but then this will help because once this thing is done right business model canvas would be most strongly be able to be built.

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Conclusion

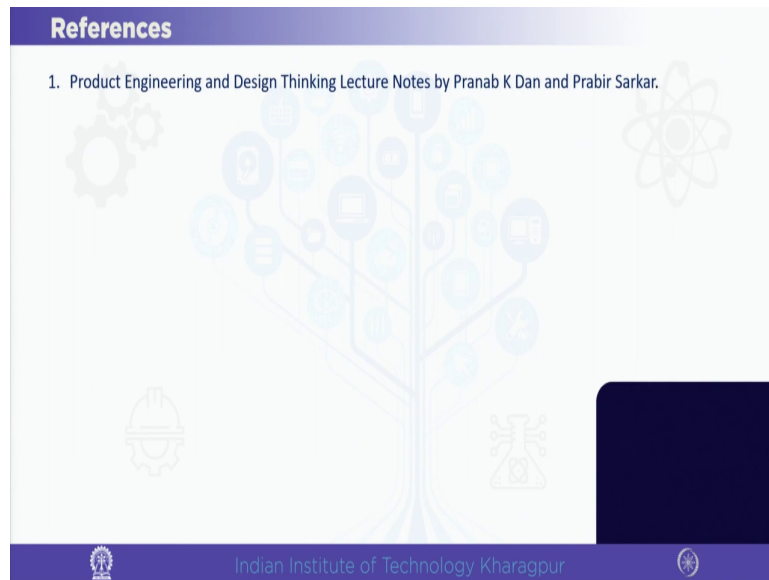
This discourse deals with Product Engineering with 'Design-first' approach in Techno-Entrepreneurship and elaborates on the mechanism using tools like Business Model Canvas (BMC) and Value Proposition Canvas, including a discussion on the three types of 'Fits' so as to be effective for designed value offerings; the product/ service and can be competitively be launched in the market, an imperative for successful Technology Entrepreneurship.

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Finally, with all these we come to the conclusion and say that this course deals with the product engineering with design first approach in techno entrepreneurship and elaborates the mechanism using tools as we have said like Business Model Canvas like value propulsion canvas including discussion on fits different kinds of fits three types of feats. So, as to be

effective for designed value offerings the products or services and can be comparatively be launched in the market, which is an imperative for successful technology entrepreneurship.

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Here is the reference and I can tell you that here is the culmination of the knowledge and if you can really go into the depth of it and new prospect future. And economy is perhaps going to be created because startups entrepreneurship is the buzz of the day and many entrepreneurs are many engineers, technologies, scientists are taking this route and being successful.

It is not only Bill Gates, it is not only Elon Mask, it is not only Zucker Bark, but there is a many. So, all techno entrepreneurs are actually going to create the future so, I believe will you.

Thank you very much for your patient hearing. Hope you will know very well, thank you.

