Innovation by Design
Dr. B. K. Chakravarthy
Department of Engineering Design
Indian Institute of Technology, Bombay

Module – 08
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Lecture – 52
The Innovation Champions
Collaborative teams

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So, now look at the interesting situation.

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You have the display which is large, you have the hose coming from the top you have a vertical organization earlier there were boxes right. Now you got a vertical sleek look. So, the organization and form is very very critical. And you had to come up with a new design. Why do you think this you know you are able to dispense faster fuel from this?

Student: More pressure from the up (Refer Time: 00:31).

More pressure from the up that is a good point, what else why do, (Refer Time: 00:37) but I am, but I am more head know if I have more head will I get more pressure.

Student: But, there is a motor pumping it all the way to the top (Refer Time: 00:41).

Anyway motor is pumping very good motor is anyway pumping. So, I took it up, but then why should those delivery rate increase.

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For example the Z line was giving us 45 litres in minute. So, you can service 500 cars a day whereas, this pump was giving us 55 litres per minute nearly 20 percent more. You could serve is 600 cars a day. So, 100 cars more as huge business and what are the other advantages having the host from the top tell me?

Student: More range.

Excellent, again you get more range that is you can go much further and fill petrol in the trucks and cars.

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What else is advantages are having a host from the top?

Student: We do not have to lift the pipe.

Damn good.

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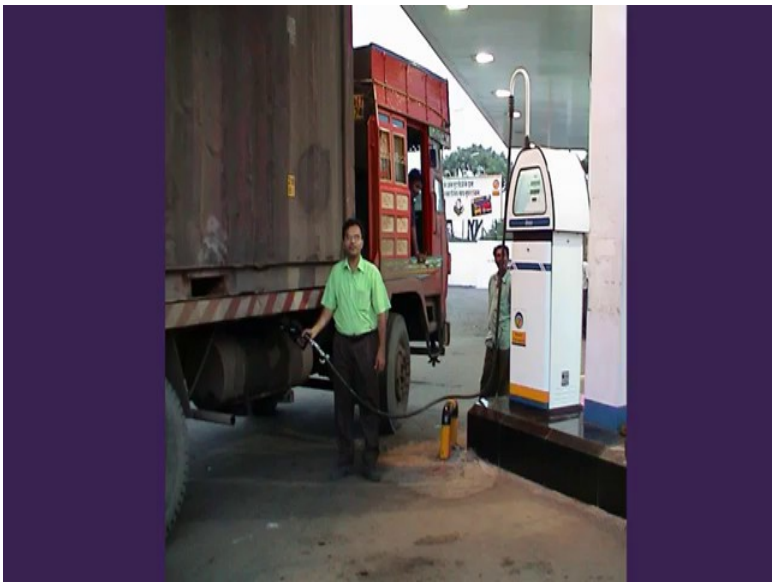

The pipe is so heavy, there is 2 litres of petrol in that pipe. So, 3 2 to 3 kilos is the petrol inside and the hose is made out of rubber and hoses are very heavy. Like if you carry there will be some 8, 9 kilos. So, just imagine the whole day that guy is lifting this hose 500 times to fill petrol in cars and dragging it along is quite a job.

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So, now you what you have? You have a hose which is hanging from the top. So, the load is not coming on to the persons hand, the fellow at the top is taking all the load.

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So range is high, excellent lightweight, the operator who is my secondary user is very very happy. He is not tired in the end of the day. What else?

Student: Does not get tangled.

Does not get tangled under the tire; so, generally hoses cars go on top of the hoses that the hoses get damaged. And you have to replace the hose every year, here there is no chance of any any damage.

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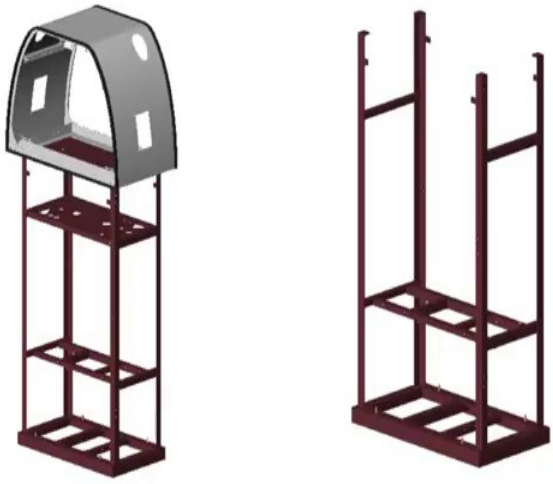

You all understand what is the chassis right, frame.

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So, this whole pump was built on a chassis. Then it had this you know convenience for mass production. I will come down to that little later again. We had a large display fascia you saw that large glass and large fascia was very critical because at that time we had

this large TV is coming in to the market. So, people were very tuned to seeing large displays. And, you know it satisfies the international norms for safety; Midco very early told me that we want to export this pump all over the world. So, the standards have to be met and then standards have to be met, explosive standards are very stringent.

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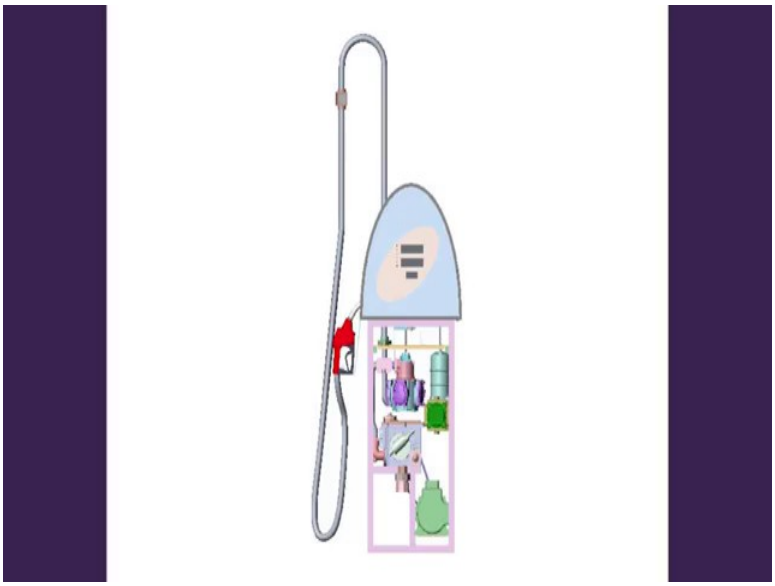

You need to have something called an air gap between the electronics and the hydraulics. So, can you see that air gap in the middle? Why do you need an air gap between hydraulics and electronics any guess?

Student: Sparking can issue (Refer Time: 03:09).

Any sparking in the electronics can you know produce.

Student: Fire.

Fire and explosion because, that environment in the bottom is rich with hydrocarbon, rich with evaporated petrol or whatever; so, you need to have a barrier between the two and that is a important norm.

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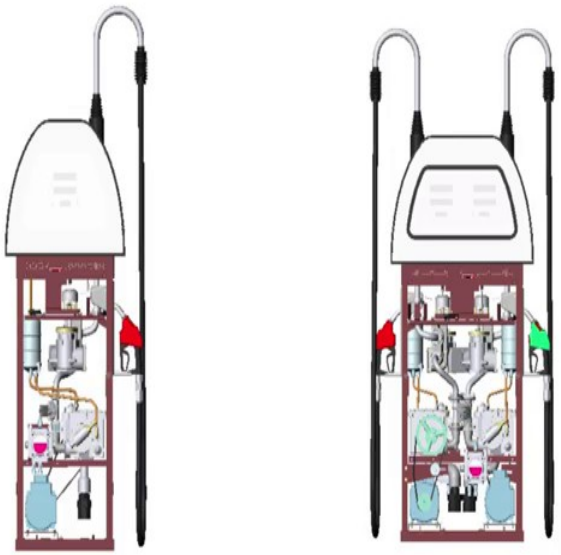

We used computer aided design a lot and we had very very high accuracies and very very high modular design.

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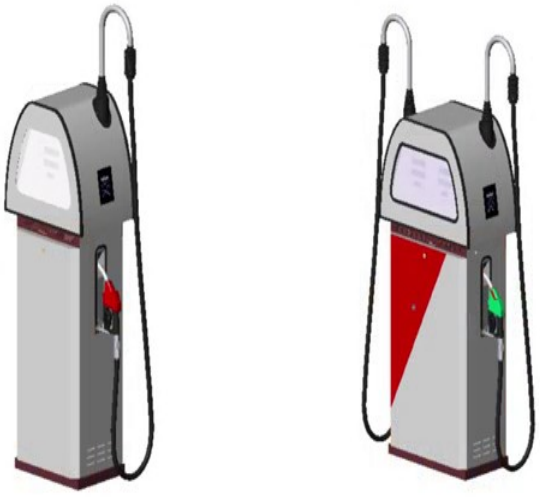

So, how computers help does was, once you make this structure; this structure you could fit a single pump and double pump also.

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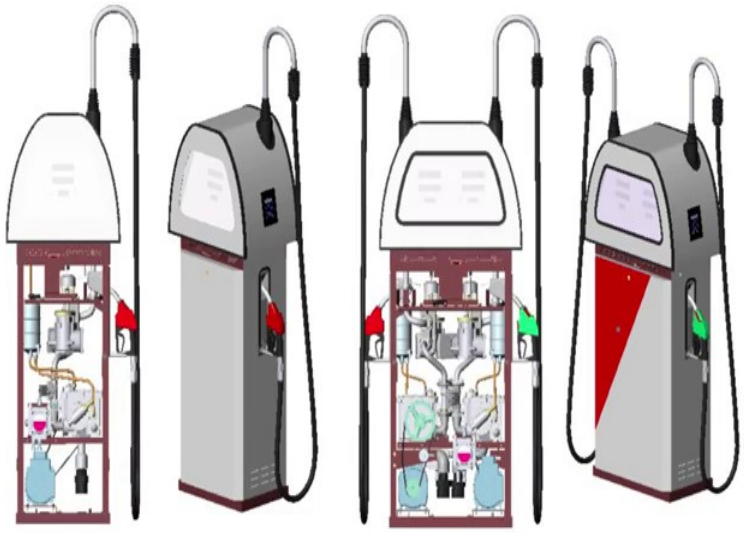

What is advantage this? Again less number of parts and you know Midco is not a company like L and T which at all its manufacturing in house. So, what they were doing? They were getting components from the vendors.

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So, when you getting components from vendors, it makes sense to have modular construction where you can have the same components again and again.

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Look at this whole array of first prototypes. In fact, as soon as Manoj joined the company.

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While he was in the in IIT he produces one first pump, after coming into Midco he produces all these pumps which are all different, it is a mechanical pump. So, can you imagine the advantage we have of putting a mechanical register into the same body. Why do people use mechanical pumps in rural areas tell me?

Student: Electricity (Refer Time: 04:29).

Severe problem of electricity and they crank you know this.

Student: Yeah.

They crank and they dispense at that time power was a serious problem. So, just look at the beauty of this design, Manoj could actually fit a mechanical register in this and you know like and have this all the advantages of the new design. And, the advantages of modular construction very very you know cost effective.

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And, then you had the you know dual pump; both sides pump and the single side pump.

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So, we had all the options over here. So, let me quickly show you now the results of the research. So, this is a research right. So, while Manoj was in the company I was finishing my research and I think how does this success happen?

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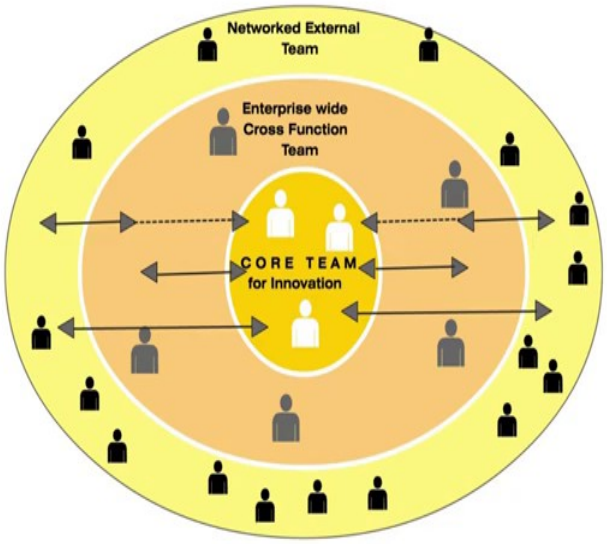

So, this is the model we developed which I showed you earlier also. The core team, the enterprise wide team and the network team very important. Any project you do even if you are doing it BTP for your project. If you follow the teaming you will get phenomenal

success and this happened regularly every time. And, then what happened with this success, you need to also divide your stages into multiple stages.

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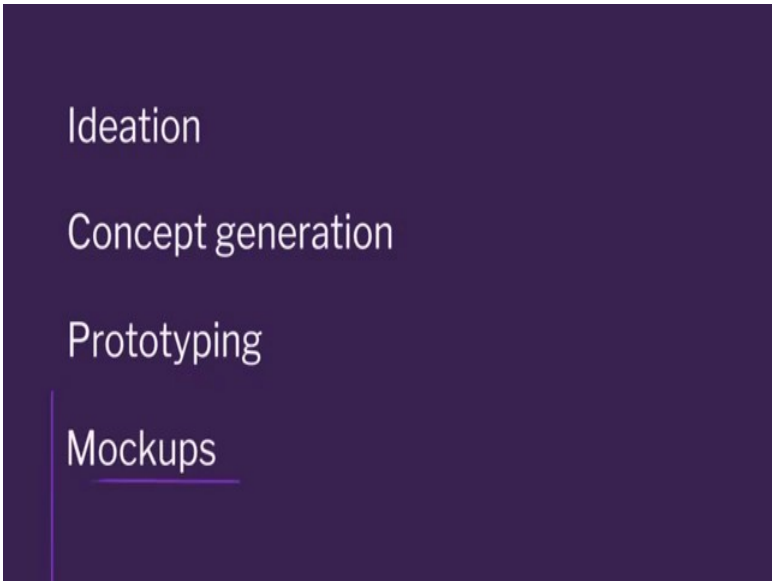

First you have ideation, multiple concept generation, prototyping, mock ups. So, all those stages are also important.

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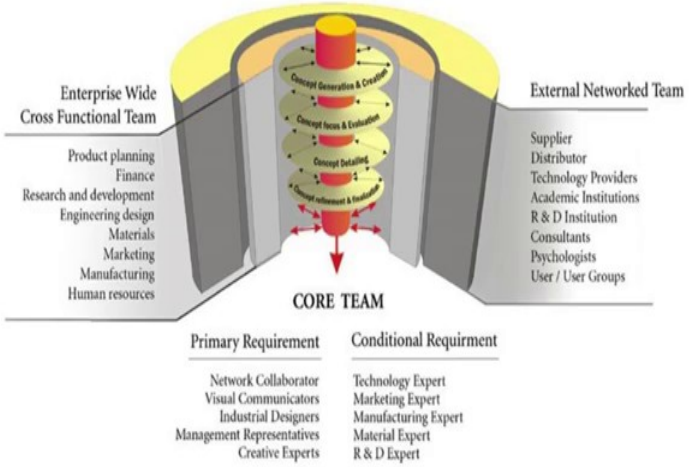

So, while you have this collaboration across teams, you also have steps in going through.

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And now look at these team members, the core team is made up of Manoj Dubey and four other engineers, CAD engineers, the prototype engineers in the company, very small team.

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But what are the bigger team was the enterprise wide type cross functional team. This was very very big, look at the beauty of product planning in Midco pumps, what was there? From mechanical pump, to single pump, to double pump and I will show you one more.

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Two premix pump, I will tell you what premix is a little later.

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So, we had excellent product planning. The company survived on investment right, how much investment you do on your prototyping and on your different components, on your manufacturing. So, investments are low and you have large range of products that was very critical.

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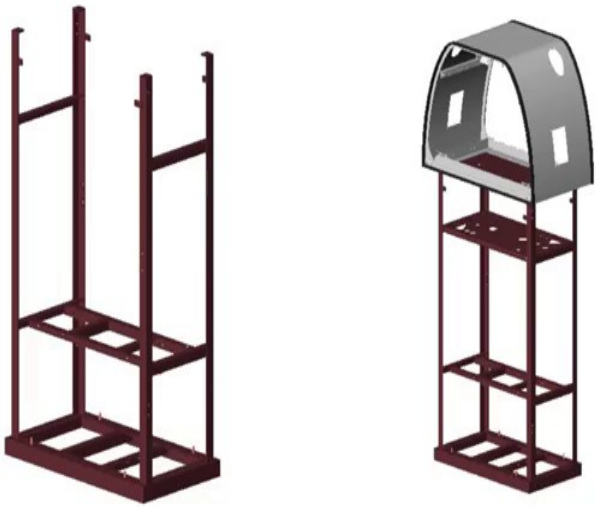

Now, there is a chassis right. So, use less sheet metal and the chassis was cheaper than using sheet metal to mount because, chassis is very strong.

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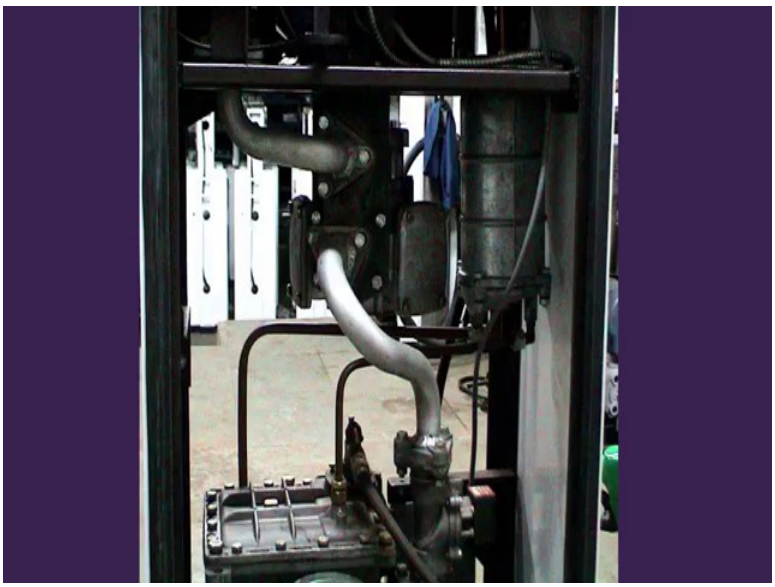

And look at these pipelines the same pipe I am using two times. And this pipe is done using special aluminum alloys in special CNC machines and now coming to my holes on the top.

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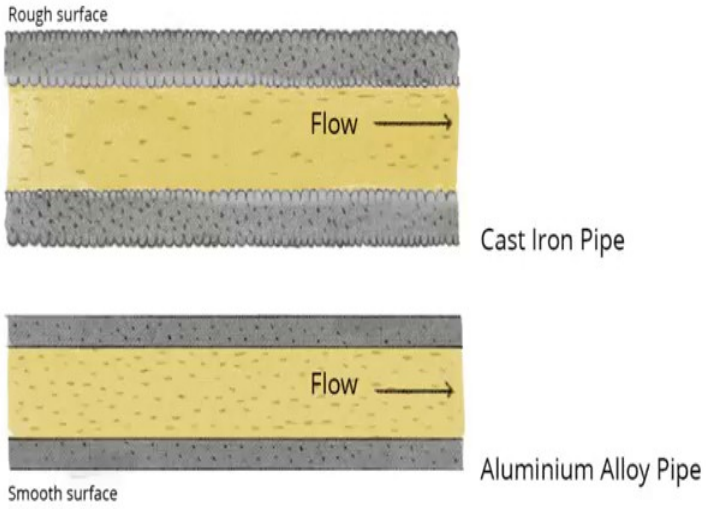

L and T was using cast iron conduits. What happens inside cast iron? The inside surface is rough, aluminum pipe inside is smooth, when the surfaces are smooth you have much better flow. So, our hose which is giving 55 litres per minute from the top actually is being aided by the smooth aluminum pipes inside also.

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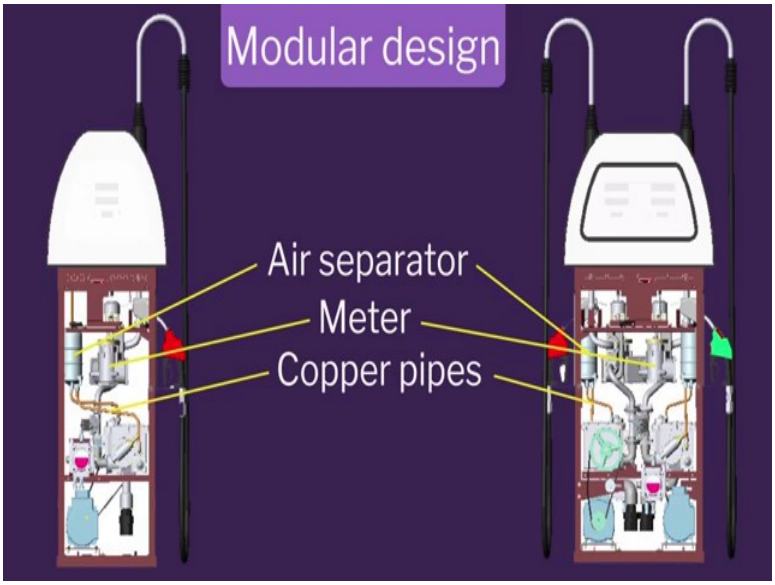

Look at the air separator; this is the air separator, this is the meter and these are the copper pipes for the air separator and this is the motor. And how all this is possible?

Because of CAD, we could double up the modular system so well and CAD was used extensively.