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

Module - 03
Start of section 4
Lecture – 16
Further insights: Alternatives in the market

(Refer Slide Time: 00:07)

So, in the design process you do diachronic and synchronic analysis. You look at all similar products in the market and you also look at all other products which will help you in understanding this.

(Refer Slide Time: 00:16)

So, here you see a lot of bottles are available in the market. So, what are these specialized bottles which we need to manufacture to understand or design, take all the interesting cues from existing bottles from their lids, from their materials and check how we can learn.

Similarly we took pictures, we asked our, you know, jawaans to send pictures from their mobiles and we could look at their operations. See the circle they are carrying in old Bisleri bottle which is light weight. But very interestingly they came and told us sir, this bottle is dangerous. Because old Bisleri bottle or the old coca-cola bottle we carry make sound and that sound is very dangerous for us. It reveals where we are and we may get shot it is life and death it is not that simple. So, that was a great insight we learnt from them.

(Refer Slide Time: 01:08)

And then we decided my god we need to make a bottle which does not make any sound, which is very robust and you know which is you know good for carrying large amount of water. So, you have to work hard to make the bottle lightweight. So, every context situation is leading to a material selection for my bottle see.

(Refer Slide Time: 01:25)

And then we also looked at all the available international filtration you know mechanisms. You all heard about this life straw? Very good for trackers and our CRPF also was inspired and they bought some life straws for themselves but they found out that

it is like not very useful because the type of clogging which happens to them is very high and you spend 2000 to 8000 rupees on this small unit.

Again context see the life straw was made for a different purpose, it is not for the critical context of a CRPF jawan who is under operation and he is in the field you know with no water, heavily thirsty that context is very critical.

(Refer Slide Time: 02:08)

Product Name	Technology	Mechanism	Sizes	Bacteria	Virus	Lifetime Capacity	Bottle	Price
LifeStraw/LifeStraw Go	Hollow Fibre Membrane	Sipping	0.2 micron	Yes	No	1,000 L	Yes ,700ml	₹1190 ₹1990
LifeStraw Mission/Family	Ultrafiltration Hollow Fibre Membrane	Gravity	0.02 micron	Yes	Yes	18,000 L	Reservoir 5L & 12L	₹ 8200 ₹ 5100
LifeSaver Bottle	Activated carbon with ultra filtration membrane	Hand Pump	0.015 micron	Yes	Yes	4,000 L	Yes, 750ml	₹ 9900
CleanSip	Activated carbon micro filter, patented media	Sipping		Yes	No		No	₹ 900
MiniSawyer	Hollow Fibre Membrane	Sipping or Squeezing	0.1 micron	Yes	No	380,000 L	Yes, Pouch	₹ 2950
Katadyn Pocket	Silvered Ceramic Depth Filter	Hand Pump	0.2 micron	Yes	No	50,000 L	No	₹ 15369
Aquaguard On the go	Space Nano Technology	Squeezing	0.2 micron	Yes	Yes	500 L with auto shut mechanism	Yes, 750ml	₹ 595

So, here you can see all the aspects which we analyze and studied. So, the first one is the lifestraw, you can look at what it is made of, what type of filtration it is doing 0.2 micron level of sieves. So, you are filtering bacteria and then you have life time capacity of how many liters pretty good. As soon as the micron pore sizes reduces what happens? The pressure to pump increases, but as soon as you go to 0.02 micron we need to use a pump otherwise it does not work.

So, it is not the technology is not around us. It is around us, but have we made it into a usable product not yet. We can go that route, but remember we made a mandate for ourselves that within the students project, we will take the project forward. So, finally, what we did? Our concern was you know very immediate.

(Refer Slide Time: 02:54)

So, we choose the aqua-guard on the go which is this particular you know the filter bottle and this filter bottle has the nano filtration inside this detail, but we said we won't use this bottle.

We will use the filter unit which is very good and with this filtering unit we will remove all the problems they were facing, remember I have telling them inside the water it was smelly? Now I narrowed down on a technology which is already available. So, now, our design can leapfrog because now you have decided a technology.

(Refer Slide Time: 03:24)

So, what are the things which we do? This technology has small pore sizes, cheaper and replaceable, extremely cost effective, easily available in Indian market. So, now, what is the next step we should do? We must see within the context you know will it work in the situation?