

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

**Module – 05**  
**Start of section 2**  
**Lecture - 30**  
**The Cause: A lightweight and durable palki**

(Refer Slide Time: 00:04)



So, we have studied the palki, we designed the palki for Ajanta.

(Refer Slide Time: 00:10)



And then we put up in our techfest 2014 exhibition. The scientific advisor to the prime minister was visiting our exhibition and he saw our Ajanta palki.

(Refer Slide Time: 00:22)



He said it looks likeweight and this looks good.

See I was visiting Jammu and Kashmir and I had a meeting with governor N N Vohra and he mentioned that there are palki bearers who have to carry the pilgrims. And its a very very difficult job for them because the palki is quite heavy and also the pilgrims are sometimes quite heavy. I knew about your center for innovation and design and you had

told me that you had designed a palki for tourists to Ajanta. And then I said can you redesign this palki for the Vaishno Devi pilgrims that is how the project started.

(Refer Slide Time: 01:17)



We got a requirement from Vaishno Devi, the governor of Jammu was very concerned about the porters' plight because it is very arduous route, very long route 14.5 kilometers they take pilgrims.

(Refer Slide Time: 01:26)



So in this situation he said why don't you work on the palki. You know from our study of innovation, you know the context is critical, the comprehension is critical. So, we

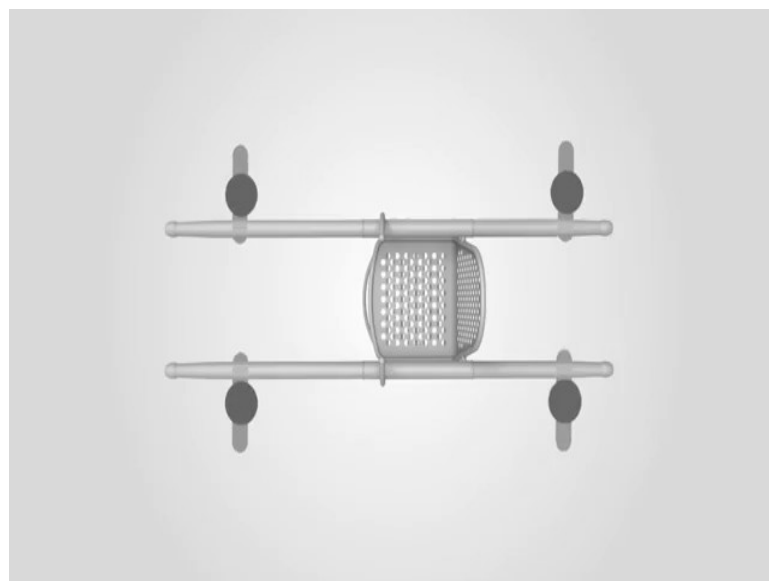
clearly knew that this particular palki which is for Ajanta will not work for Vaishno Devi.

(Refer Slide Time: 01:42)



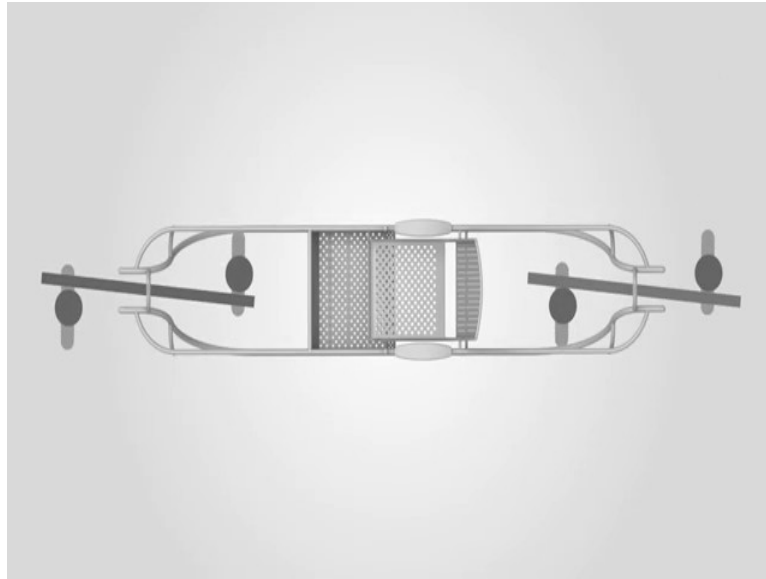
We must know that you know the contexts are different, the people are different, the terrain is different. So, we started work on the Vaishno Devi palki. We visited Vaishno Devi, we went over there and we checked how they carry the people. You saw in Ajanta?

(Refer Slide Time: 01:59)



Four guys were standing, two people standing next to each other.

(Refer Slide Time: 02:05)



In the Vaishno Devi shrine, they are actually standing one behind the other. There are a number of reasons for this and we will understand why this is you know so critical for them. And then they also have very interesting camaraderie. They are together as a group four of them they know each other very well, they are they plan their trip you know very effectively, long journey and its very strenuous. Its 14.5 kilometers it takes three hours to reach and you are carrying loads as high as 80 to 140 kilos.

Sometimes elderly can go up to 140-160 and they cannot say no to anybody. They have been on this job for a number of years you know, their children are doing it, their parents did it. So it's a legacy they know how to handle the situation. I like to quickly show you a small video you saw how the porter actually was moving, the load is very heavy.

They keep you know shifting from one shoulder to another and with that shifting they actually distribute the load among themselves and they also in sequence once the first person shifts the load, the second person shifts the load on the other and then the third and then the fourth. They have a very good sequence and a good understanding and how this can go forward.

So, we visited with our team of designers, we visited the shrine we looked at how you know the porters are working and what are these you know the livelihood opportunities. We also went to their villages. Nearly 1000 to 1500 porters are there in Katra region in Jammu and all of them their livelihoods are dependent only on this job.

So, there was a motorable road which was done and they were planning to procure electric vehicles for the motorable road. And then there was a big strike where some 1500 of these people went to the governor and said you are killing our children, we will lose a livelihood and we go hungry. So it's a very interesting social realm.

So, now tell me do you let this happen because the porters really have musculoskeletal problems. So do you improve this or you completely eliminate this is the question we need to ask ourselves. Some of my students said sir you should not work on such a project because you know it's really bad for the porters to carry so much load. Whereas, another school of thought is make the palki lighter.

(Refer Slide Time: 04:35)



Another school of thought will say no, this should not, we should put a rope way, you should put electric vehicle on the road and you must not make people go through this hardship. So, what stand will you take in this class?

Student: Ask the people in terms of the (Refer Time: 04:48).

That is a very good question and they surely prefer to use the palki because for them it is second nature.

Student: But if they do not know what are the possibilities they would like to continue with the way of life that they know.

That is was a good point, but they know the possibilities if you have a motorable road people will not use the palki anymore.

Student: A possibility from their side is that they are going to be losing their job.

Exactly.

Student: They do not know that maybe they could be actually working with a particular system or something of the sort where they.

They could be getting jobs you are right, that's possible, if I was at the ministry of social justice I would see to that when I implement a motorable road all these 1500 people get some jobs.

(Refer Slide Time: 05:32)



So the whole aspect is this there are multi level users for the palki. Do you take care of the porters? Do you take care of the pilgrims? Do you look at the shrine board and then you know they were local vendors, for manufacturing this for them. Shrine board organized all this very effectively saying that you have to be disciplined and in this activity there should be no accidents. So, how do you weave all these people together in your ,you know, study is a very important aspect.