Innovation by Design
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Module – 05
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The product, the users and the context: The existing palki

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Can you look at the type of strain they would go through if you are carrying 180 kilo person and you are going down the stairs, you have to balance the stairs like you know really very very skilled job.

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Every time we observe new grips.

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You saw the grips on the top, grips on the side. These grips are not only to carry the pilgrims these grips also were to actually balance the palki.

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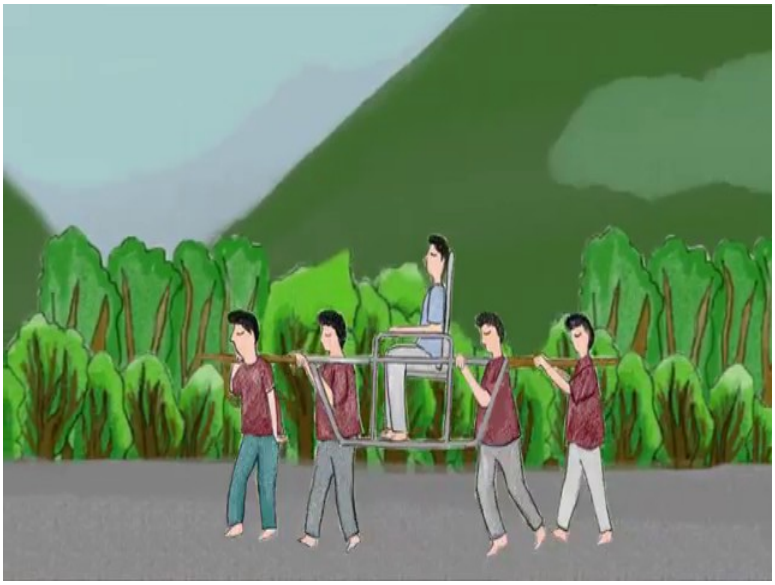

One of them slips, it actually supports them, other three support them if they slip. See we were so much developed in the design, what is the best bet for us? And we also see very very close hairpin bends like this where the length of the palki has to be really fixed, you cannot really increase the length. Look at that bend and how the move in what type of distances they move in.

So, the project is getting more and more complex in the context study itself, we took the cause I said come on we design a palki which is lighter for the porters, but context is very very challenging. How can you do something worthwhile for these people? And then we went and observed the palki very closely.

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We found out that this is grass root innovation. They pick up whatever local material is available.

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What is available locally is water pipes everybody has water pipes.

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The GI water pipes Galvanized Iron and those pipes are very heavy, they are very thick.

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They weld them together and we also get know from metallurgy that when you weld galvanized iron pipes together the welding is not very strong the metallurgy point of view. Because constant loading and cyclic loading there is cracking in the welded joints and then also it is very very heavy.

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So, we started studying the thing very closely and there is some wonderful details like this ring and the rope. What is the rope doing to the ring and the ring to the log of wood which is going onto the shoulders?

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The log of wood is a phenomenal shock absorber which actually sits on the shoulder and its very friendly to the human body because it absorbs a lot of shock. And the string which you see which is tied inside also is another very interesting manoeuvrable flexible design. So, the heights of the porters are different this threads help you to sort of level them.

Now, I am going to tell you a very interesting thing about rituals and practices. For example, the thread actually is replaced every year to make it you know sure that people replace the thread, they made a ritual that every you know festive season the shrine board will give this new thread to all of them. Though it is the thread is good, but they do not even leave one chance of failure. So, you taking care of safety through a ritual, design conscious you know safety mechanism.

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And then you know look at the joints between the parts, the seating details, the posture and look at the corners they were all stress cracked and broken and they were welded together. And when you weld together, what happens? You add more material, so it becomes more rigid.

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And then the most important aspect is how are the porters body sort of adapting to all this, there is a lot of adaptation. Some of them have these type of projections coming out on their shoulders like you know they get bruises because of this. And I am very fortunate to tell you that ours was a collaborative effort and all these work is done by the ergonomics team in NITIE. The whole team of the designers, scientists are working on the ergonomic aspects then. These pictures are from the NITIE's aspect.

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So, now we look at the redesign of the palki. So, we know very clearly they should be light weight, the more lighter the better for the porters, it should be maintenance free we found out from the porters if you palki is broken and it nearly takes a month or two for

them to repair it. So, it's a loss of revenue for them. It should be manufactured locally that is a very big challenge, should ensure safety for porters as well as the patrons. So, the safety aspect should be very critical I should never break in the middle.