Innovation by Design
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Module – 05
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Lecture - 33
User needs: Insights from ergonomics

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So we made one more prototype went back again to Katra to see what happens and this prototype we also sent to NITIE for trials.

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So NITIE has a whole team of peoples, students working on industrial engineering. So they you know did a lot of trials on this, they are the ones who told us that you need a headrest. So, we provide a headrest for the pilgrim.

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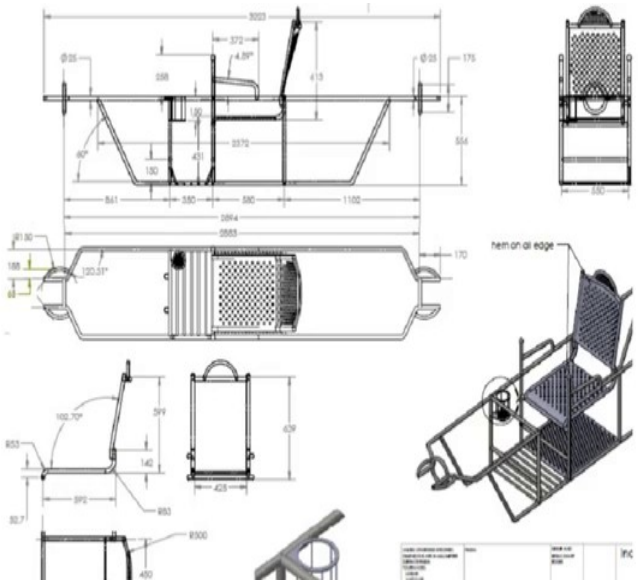

Then we also got you know challenging aspects of the dimensions.

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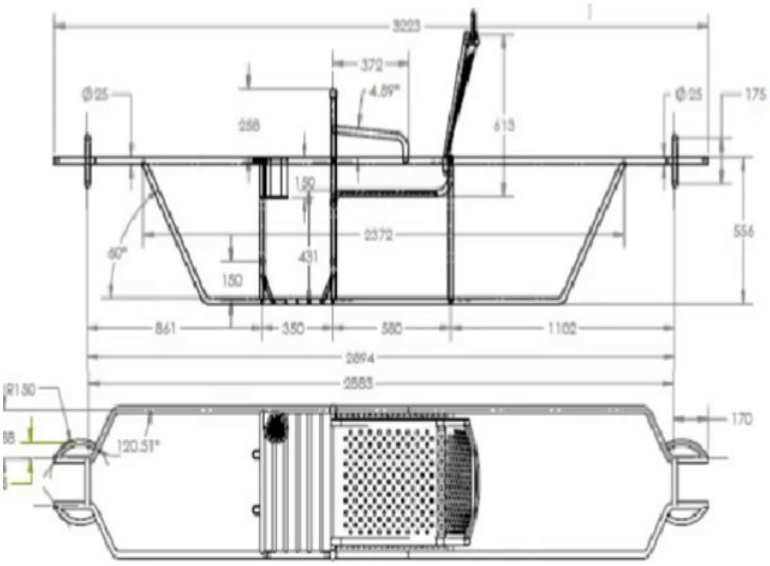

You can see these are the dimensions which are very critical.

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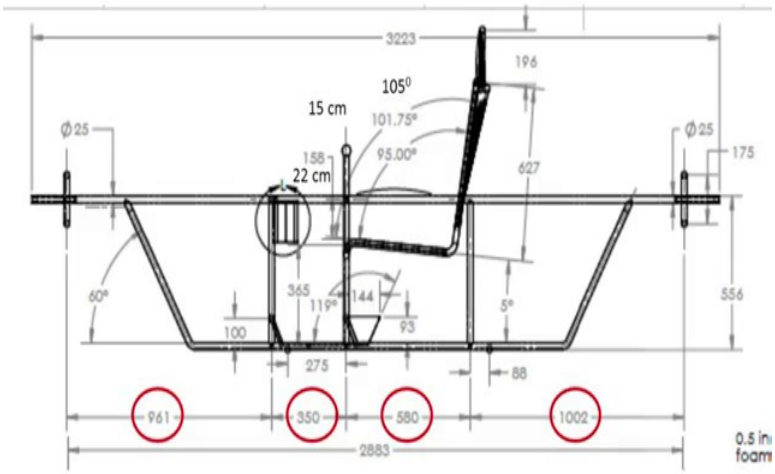

Because these are the spaces in which the porter is sitting. But now tell me when the group comes together they could be different heights of people right.

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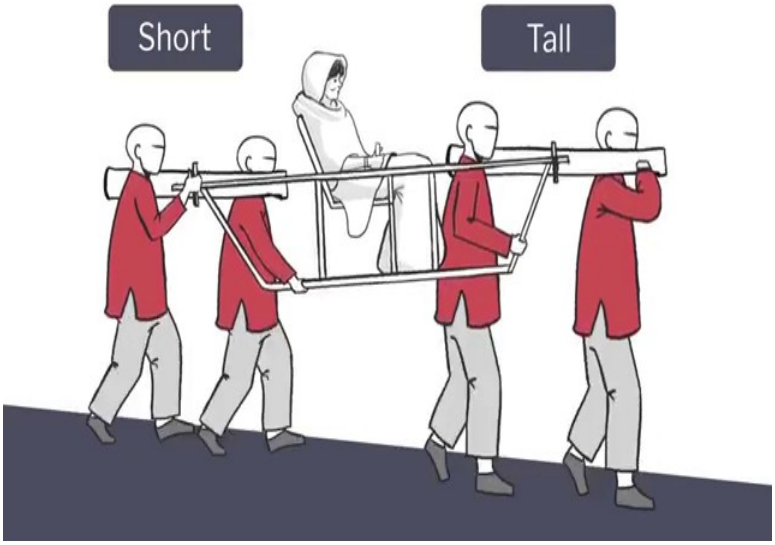

For their heights they go and customize the production to their need. So now here I am coming with a standard design and the dimensions are varying. So, we had a tough problem and the same thing happens with your mass production products how will you make adjustability in this if I had adjustability in this, what will happen?

Longevity, cost all those factors will come in. So, we had a very tough lesson of you know studying the anthropometric data of all the porters coming back onto the drawing board and checking out what exactly can we do with these dimensions. They were very happy because it is more compact the center of gravity was taken very well. So, they were you know extremely happy because they need to customize production at their end sometimes you know the vendor does not do good work. So, here we gave them excellent dimensions, excellent control. So, they were very very you know comfortable and happy.

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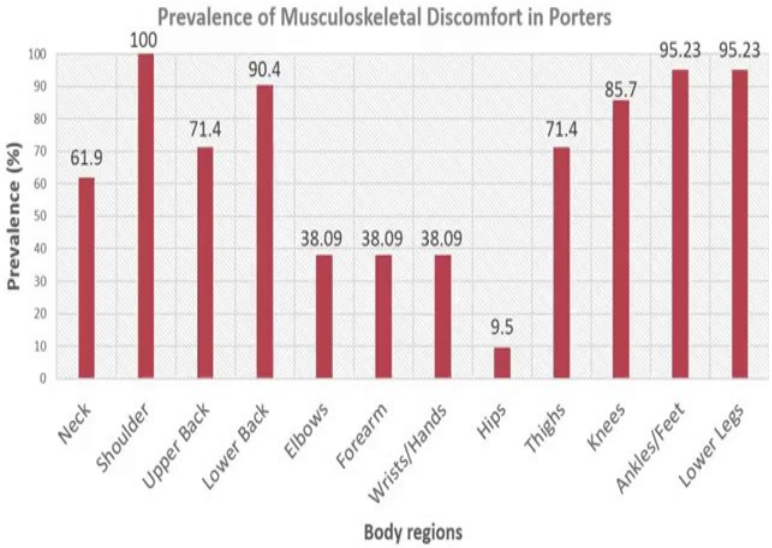

These are all the you know initial study of what all happens with their musculoskeletal discomfort because of those heavy loads. Even if you reduce 10 kilos or 5 kilos you have tremendous amount of advantage. So, that advantage we took into our stride and we know then we went and you know checked what happens with the final. So, in the final one they again came up with lot of suggestions they said the head rest actually makes a pilgrim sleep. And what happens if the patrons sleeps on the palki?

It goes out of balance the guys like going in like that and getting up like that. Then the porters are waking up the guy ‘sona math , sona math’ that the people are sitting in the palki now supposed to sleep you are putting them on a swing and you are asking them not to sleep it’s like that. So, how do you bring in that discomfort so that they do not sleep? So, what is more important? More comfort and risky fall or discomfort and safe journey ? Very big challenge these are called tradeoffs in design.

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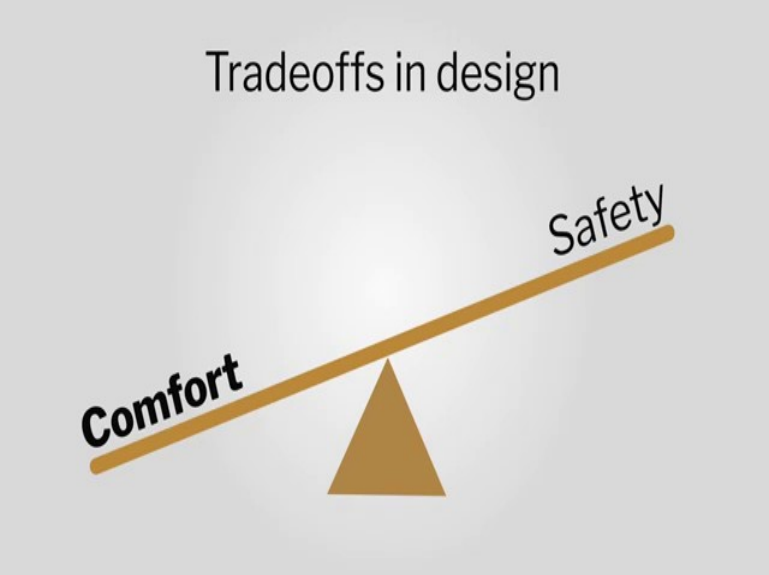

And I have NITIE you know,they say that no we want to make the person very comfortable there is no question about that. And I would say no we need to trade off comfort to safety.

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So the headrest was removed, rest of the patterns were very good. The dimensions were accurate, they wanted a very good footboard over here so that the pilgrim does not slip off. So we gave a wonderful footboard to them, we give a place for them to store their bags if you can see the place for bags, strong grips correct ergonomic incline and with all that we you know again went back to our study of you know what is happening with the palki you know we already gave to the fourth product we need to now move fast.

So, the weights are ranging from 38 kg to 70 kg in the current palki. So, we want to at least bring them down to 34 -32 even 1 kilo less is great. Porters are required to trek for 28 kilometres in a day up and downhill they usually take 4.5 hours so it's pretty arduous. Due to the heavy load on the shoulder they shift you know quite a bit we saw that. So the shifting should be very convenient and easy.

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Our major focus is to reduce the strain, should increase porter comfort and should not destroy the current livelihood of porters this is very important. The livelihood you know should not go, should become more comfortable and easy for them. We again had some very you know important study from the anthropometric data. NITIE again you know pitched in with their studies and fine tuned the dimensions effectively after the studies.

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So we fine tune the gaps between the first porter, the second porter, the third and the fourth to make our final design.