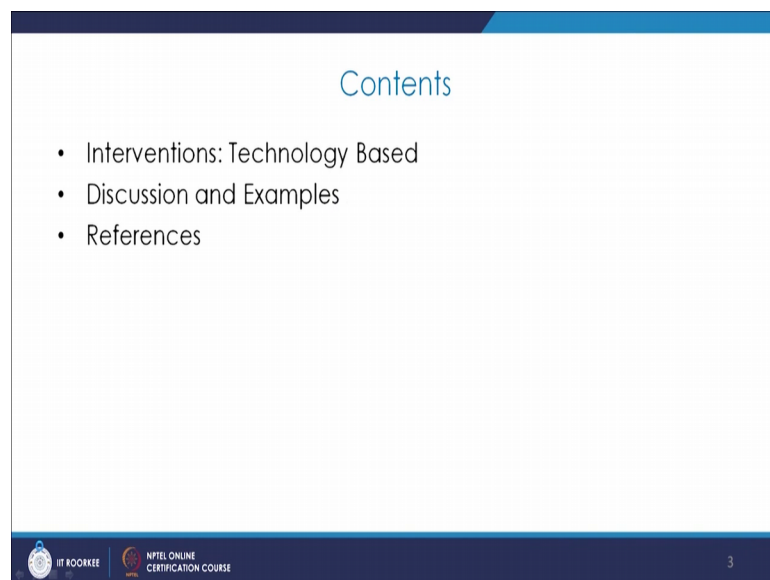


Role of Craft & Technology in Interior-Architecture
Prof. Ar. Smriti Saraswat
Department of Architecture & Planning
Indian Institute of Technology, Roorkee

Lecture - 38
Interventions: Technology Based

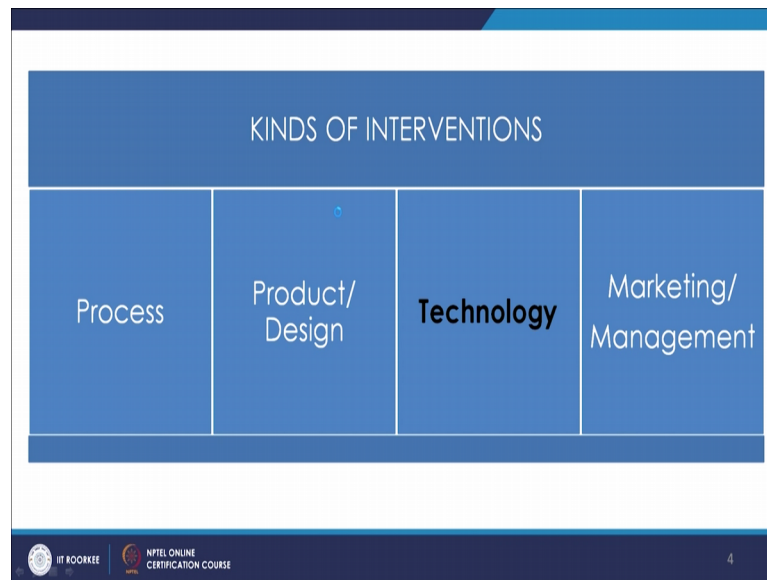
[FL] Hello, everyone. Welcome back to the NPTEL course Role of Craft and Technology in Interior-Architecture. Today, we will talk about module number – 38, where we will discuss the interventions focusing on technology.

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So, while discussing about the technology based interventions in few previous modules we already tried to understand that why the technology interventions are required. So, we will try to discuss a little bit more on the same lines and we will see some examples.

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So, we have already begun trying to you know classified the kinds of Interventions and we have been focusing primarily on the four kinds; process based, product or design based, today we will talk about the technology based interventions. And then after that we will talk about the marketing and management based interventions.

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"The integration of technology in craft practice has affected virtually every aspect in the craft products lifecycle from conception and design to final sale. The opportunities opened up by technology need to be seen in the context of broader shifts and changes that influence how products are marketed and sold"

- RICHES and Coventry University. "D5.1 The Use of Craft Skills in New Contexts", 2015

The slide is from an NPTEL online certification course. It has a blue header and a white body. The quote is in blue text. At the bottom, there is a citation in black text. The slide also includes the IIT Roorkee and NPTEL logos at the bottom left and the number '5' at the bottom right.

Now, we have already tried to understand that there are several issues and challenges that the craft sector today is facing specially in India and most of the study that we have gone through also highlighted that the lack of technological advances is one of the reasons

why this sector is facing a setback and we also tried to understand and learn about some new technological advancements and techniques. So, we tried to understand about the CNC techniques the CAD – CAM models and few other examples and how there is this whole new range of you know products coming up which combines the hand skills and the technology.

So, taking our discussion ahead today also we will try to gather some information and then try to understand how the technology interventions can play a very vital role in the development of craft sector. So, the integration of technology in craft practice has affected virtually every aspect in the craft products life cycle from conception and design to the final sale. So, technological interventions help at varied stages and overall they have helped in increasing the production, the value of the craft, the sales and also the up gradation of entire skill set possess by the craft persons and their living standards.

So, this is one area where lots of inputs have been given by the ministry, lot of organizations individuals and educational academicians. And the kind of technological advancements that are coming up are only reinforcing the importance of you know having a module like this and studying these interventions.

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- A **resurgence of interest in 'making' and craft products**. This means that there is a **broader consumer market**, but also one that is more demanding, with educated tastes;
- The **democratisation of design, with patterns, techniques, tools and resources being freely exchanged, and consumers often involved in co-creation of products and services**;
- Promotion of ethical **approaches advocating sustainability, ecologic use and local production and development**;
- **Promotion of a DIY culture** which blurred significantly the boundaries between professional and amateur craftspeople and designers.

- RICHES and Coventry University, "D5.1 The Use of Craft Skills in New Contexts", 2015

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So, when we are talking about the technological interventions or the technology based interventions, the importance consideration are you know many, but these are few that have been highlighted by one of the studies. Resurgence of interest in making and craft

products and this ultimately would ensure broader consumer market. So, making an craft products if there is an increased interest and there is an exploration in making itself of course, it will reflect on the market and the consumer buying the products.

The democratization of design with patterns techniques tools and resources being freely exchange and consumers often involved in co-creation of products and services. We had a discussion on the same lines where we are talking about sharing of ideas, knowledge sharing, exchanging of ideas, co-creation and that how the market is driven today, then, promotion of approaches which advocates sustainability, ecological use and local production and development.

So, we also saw one example you know one international case study, where the craft persons community realized the importance of local resources and they tried to tap the local resources and their production increased many folds and their way of life the living standard got better, the income got better. So, again that is one of the primary focuses. Also the promotion of do it yourself culture which is on a boom these days and it is really catching up and it is very important that you know this kind of hands on and doing it on our own this kind of culture is promoted and the skills are promoted.

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Factors driving a European Craft Revival and the Emphasis on Technology Interventions

Social, cultural, and technological factors contribute jointly to a craft revival manifested as:

- A resurgence of interest in craft skills and a Do It Yourself (DIY) culture and ethic;
- The **emergence of digital fabrication and hybrid forms of making**, spearheaded by online and offline maker communities;
- A rising consumer demand in unique craft products;
- The **reinvention and repositioning of craft skills, techniques, patterns and materials, and their augmentation through integration of digital technology**; and
- The promotion of ethical approaches advocating sustainability, ecologic use and local production and development.

- RICHES and Coventry University. "D5.1 The Use of Craft Skills in New Contexts", 2015

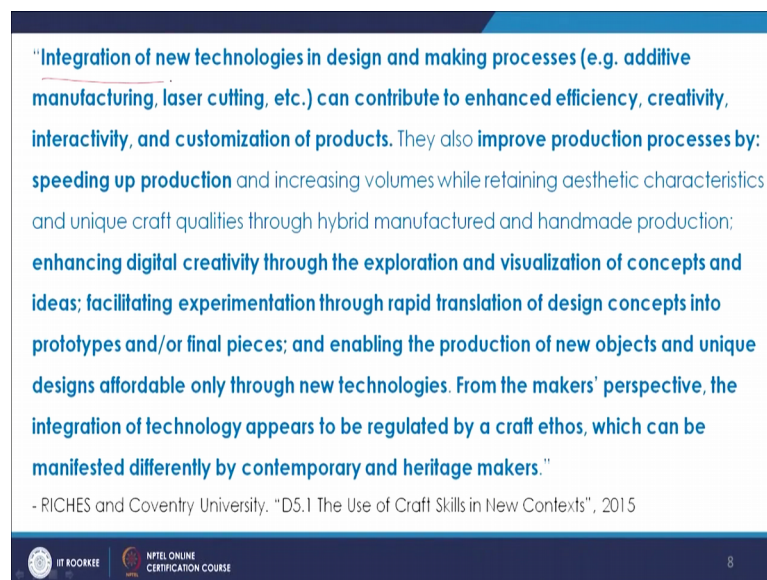
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Now, when we see the factors that drive the European craft revival, they also emphasis on technology interventions; so out of all the factors that we see here there is also the emphasis on the technology interventions in few of them which are enlisted here in bold.

So, the emergence of the digital fabrication and hybrid forms of making, the reinvention and repositioning of the craft skills techniques patterns and materials and they augmentation through integration of digital technology. So, they also emphasize on the technology intervention part.

So, when we are talking about the technology intervention there are lot of researches that are happening and there are lot of designers and researches who are talking about these technology interventions and they are trying to find out various models frame works and the ways in which these interventions can be introduced and harnessed and they are also acceptable at a community level and then they could also operate and utilize this interventions on their own, without being dependent on others.

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Integration of new technologies in design and making processes for example, additive manufacturing, laser cutting etcetera can contribute to enhance efficiency of course, creativity, interactivity and customization of products. Now, customization of products is very important, because that is what make crafts stand as a unique hand product rather than something which is mass produce and available you know at every nuke and corner.

They also improved production processes by speeding up production and then enhancing digital creativity through the exploration and visualization of concepts and ideas. So, this technology could help the craft persons you know explore and visualize and concepts and ideas facilitating experimentation through rapid translation of design concepts into

prototypes. It also enables prototyping and final pieces, enabling the production of new objects and unique designs affordable only through new technologies.

From the makers perspective if we talk, the integration of technology appears to be regulated by a craft ethos, which can be manifested differently by contemporary and heritage makers. So, the important point is that the craft ethos has to be maintained and the craft persons and the community who have this skill sets and who try to integrate this interventions must welcome them as something that would better their existing conditions and not as an imposition which they cannot really work on their own and which they have to depend upon somebody else to take care of.

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So, when we talk about technology intervention there are also business models and frame works like we were talking about which highlight the importance of these interventions. New business models and organizational forms are afforded by the integration of digital technology. For instance: model based on emerging technologies such as digital manufacturing, models thriving on e-commerce, collectives and partnerships between makers and creative entrepreneurs and other forms of associations.

So, there is this digital technology which has seen this upsurge specially in the last you know two decades. And then we see lot of models which are emerging and there is the play of digital media, there is a play of partnership and associations and there is also the application that we see which are more like you know a web based they also our social

media based. So, that way technology is taking over and then craft sector is also trying to make use of such technology interventions.

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"Craft productivity is an inevitable problem in contemporary society, and is also one of the driving forces for crafts entering commercial production and everyday life. Recent years have witnessed an acceleration of collaborative innovations among making (craft), new technologies and entrepreneurial approaches(KPMG, 2016). These include: improving and innovating traditional crafts by appropriately adopting alternative materials, engineering and technologies; improving its efficiency and productivity, yet not compromising its spirit and craftsmanship."

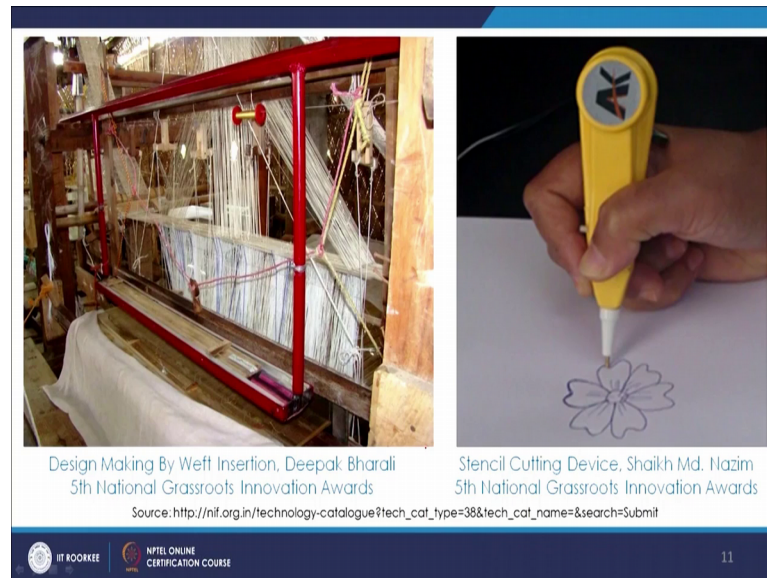
- Xiaofang Zhan, Stuart Walker, Ricardo Hernandez-Pardo & Martyn Evans (2017) Craft and Sustainability: Potential for Design Intervention in Crafts in the Yangtze River Delta, China, The Design Journal, 20:sup1, S2919-S2934, DOI: 10.1080/14606925.2017.1352802

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So, craft productivity is an inevitable problem in contemporary society and it also one of the driving forces for crafts entering commercial production and everyday life also. Recent years have witnessed an acceleration of collaborative innovations among making new technologies and entrepreneurial approaches. So, this collaboration is already happening and it is giving a way to new platforms. These include improving and innovating traditional crafts by appropriately adopting alternative materials, engineering and technologies.

So, again we say it see a lot of mention about the role of technology, the play of technology and the skill sets possessed by the community and how the interplay of all of this factors could actually a result in a successful community craft practice or an individual craft persons way of life. So, technology interventions again a one of the major kinds of interventions that are now affecting the craft sector and also really helping improve the conditions and the living standards of the craft persons and artisans.

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So, there are some examples and these are from the NIFT, national innovation foundation and too simple ones. Here if we see this is the design making by weft insertion and it also got the National Grassroots Innovation awards and here we see this a very simple innovation which is this stencil cutting device.

So, technology interventions again it could be at the level of machine, it could also be a technical knowhow, it could also be improvement in the existing hand tools or power tools. So, it is a play of all these at different stages and different capacities which ultimately you know help increase the craft production and help increase the craft person have a sustainable livelihood.

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**SPACE MAKING
(WOOD TURNING
LACQUER WORK)
CRAFT WORKSHOP**

Space Making (Wood Turning - Lacquer Craft) Workshop, Dholka, organized by Design Innovation and Craft Resource Centre (DICRC), could be considered as a pilot project, which would make possible to have insights for the subsequent workshops. The workshop was a component of the Design Innovation and Documentation of Space Making Crafts of Gujarat project of DICRC. It was a work done over ten days (1st Dec - 10th Dec '16), and engaged a cluster where the craft of wood turning and lacquering has been practiced since last 50 years. It is located in the village of Dholka, approximately 40 km from Ahmedabad down the Sabarmati river.

Design Innovation and Craft Resource Centre, CEPT University, India

DICRC, at the faculty of Design, CEPT University, India, is a center for research, study, documentation, and organizing programs and projects related to 'Space Making Craft' (SMC) of vernacular and traditional built environments of India. It is a platform where contemporary design thinking engages with a range of Space Making Craft and trade skills. DICRC would be a knowledge and human resource, a node for innovative thoughts and practice to meet with an aim to incubate new ideas and create new paradigm shifts for the understanding of craft through the changing times. Moreover, it aims to function as an interface for the development of regional SMC through documentation of traditional living heritage, craft cluster mapping, SMC workshops, craft design innovation, training of craftspeople & curriculum development in Rural Technology Institutes, national international linkages, providing a platform for discussion, national international seminars and forums for role of SMC in Interior Architecture.

The importance of craft as a means of livelihood, and sustainability is also being considered simultaneously by DICRC through this process. Another main objective for DICRC is to initiate partnership projects with and among the important craft related role players and to formulate new policies which would help craft and design field.

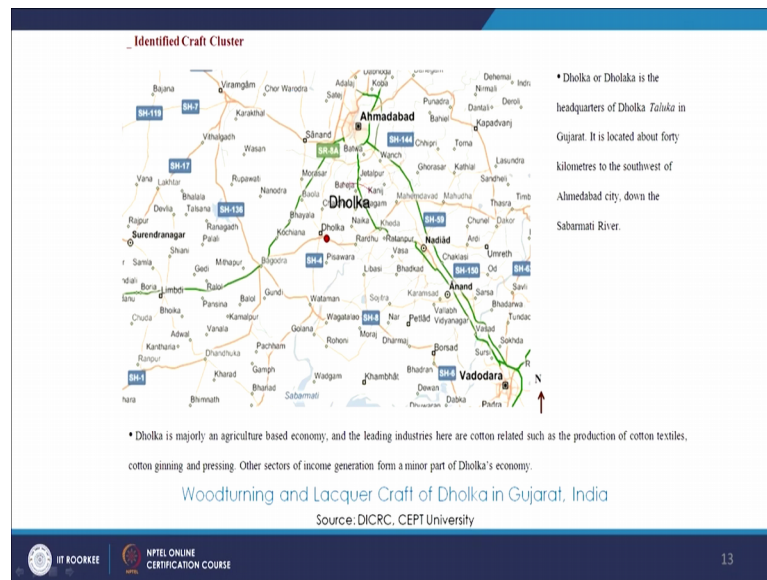
The course coordinator worked on a Monograph (Research, Documentation, Text, Prototype Development and Post-Production Team Work) of Wood-Turning Lacquer Craft of Gujarat (specific reference to Dholka) at DICRC, CEPT University
Source: DICRC, CEPT University

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So, here what we see we have already discussed many times. This wood turning and lacquer craft work shop, but we have always discussed it in bits and pieces. And I am trying to discuss it in a sequential way and trying to establish that you know how the technology base interventions and product design base intervention can actually help a craft sector or a craft practice sustain. And this is of course, done with DICRC and I worked on the mono graph which focused on this entire work shop and the background research and later this was also published as a paper. So, I am just trying to discuss the findings of that paper and discuss the process that went throughout this work shop while I was working with DICRC, in Ahmadabad.

So, this is the very indigenous craft which is practiced in Gujarat and it is called as wood turning and lacquer work craft.

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And, particularly, we went to this craft cluster Dholka which is not far from Ahmadabad and we were trying to document the existing families who work on this craft form and what is the process, the method, the raw materials they use like everything the kind of work space they use, and what is the value and meaning of this craft to them you know in contemporary times, and how it has really transformed or evolved during a you know last say 50 years. So, as a team we were just trying to document that and understand.

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And, we met lot of craft persons there, but we were particularly working with Anil [FL] he had lot of experience and this work shop happened almost like 5 – 6 years ago. So, now, the experience is added up and he is you know the one of the younger generations who is working in this craft form and of course, the legacy has been carried already by the older and much more experienced generation.

So, he is the one who was very receipted to new ideas and he wanted to explore and understand about you know the improved technical knowhow, the different prototypes that would completely redefine the product range that he works upon. If there could be any kind of technology intervention and the lathe on which he works could be also improvised and it produced better results, because while we were studying we were tried to understand that there were constraints. There were limitations forced by the lathe the power lathe which the craft persons use for turning the wood and making the sections you know of the wood which would then join to create a prototype.

So, those who are the discussions that happened and they were like several visits and Anil [FL] was very accommodating and receptive he himself had lot of ideas for it was very fruitful process.

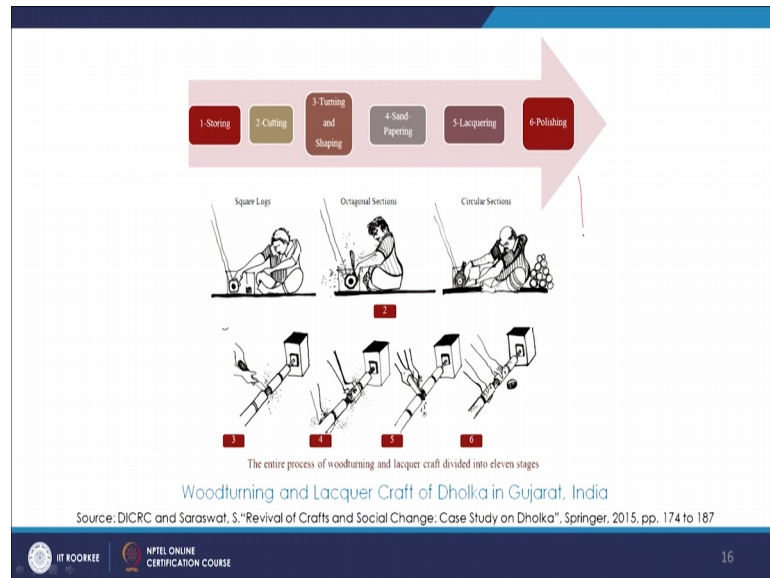
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So, this was the work shop where he worked and you know the different. Kinds of tools and machines and this is the cross section that explains the spatial configuration of the works space which is used by the craft persons. So, also we were trying to understand the

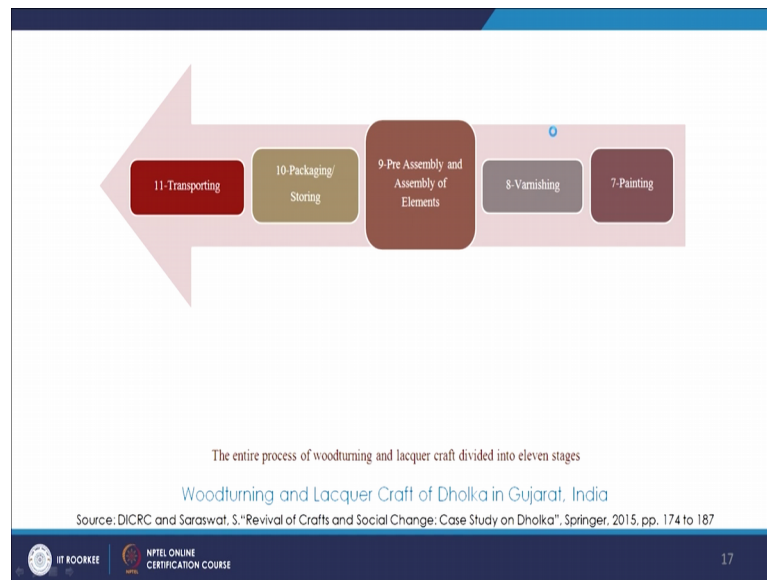
postures and which this set what all different kinds of you know hand tools, power tools and machines they work with then we also a documented the step by step process of you know how this craft is practiced and right from procuring the row raw material the wood how you know each stages progressed and all the way till you know if finally, how it is transported.

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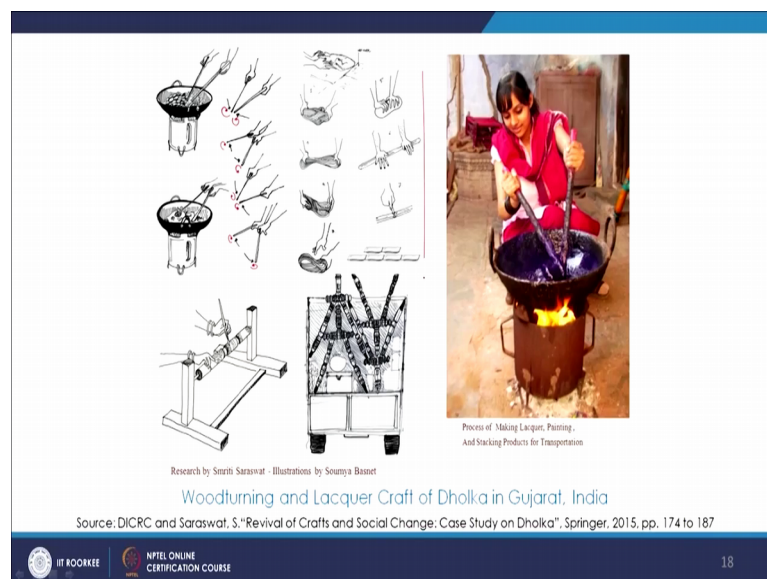
So, through illustrations which was done by the team and this was documented. So, storing, cutting, turning and shaping, sand papering, lacquering, polishing all these stages were understood and documented.

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Painting, varnishing, preassembly, packaging and of course, the final one the transporting; so, all of that was tried to you know unders try to be understood documented.

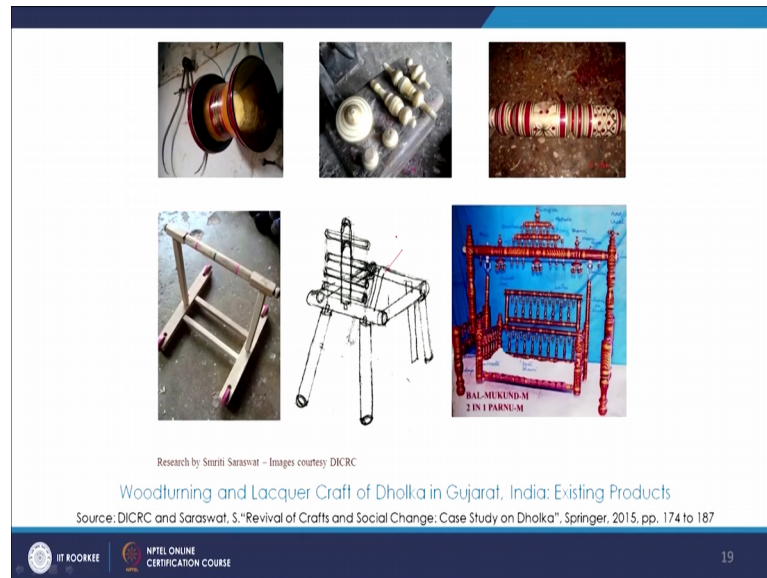
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We also tried to learn you know how the lacquer is used and how the color is done and at what stage the woman are involved and where do they procure their raw materials from and then you know stacked so effectively, so that the optimum space utilization could be done while transporting and this could also be economic. So, all these things were done.

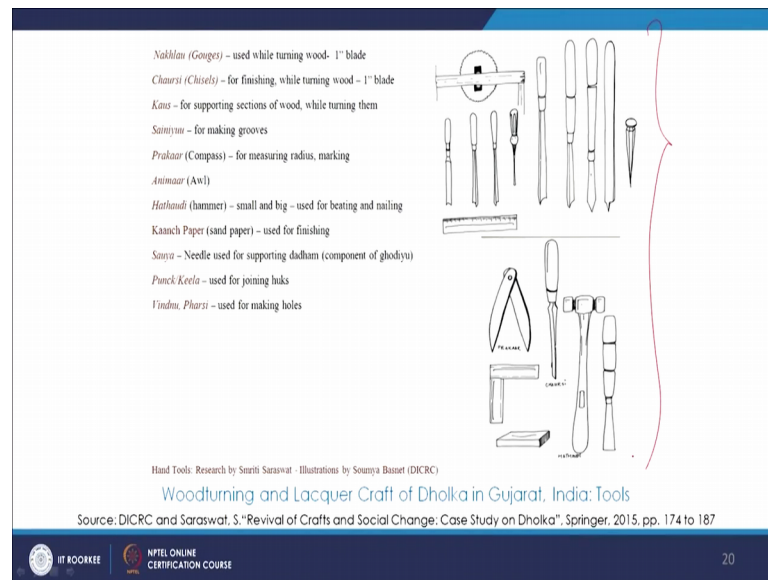
So, what this paper what this paper tried to understand and what this attempt was? First of all to understand what was their existing product range is and how during the course of this work shop with such university and new product range could be suggested, along with the explorations and alternative materials and not just the timber that is already being used there.

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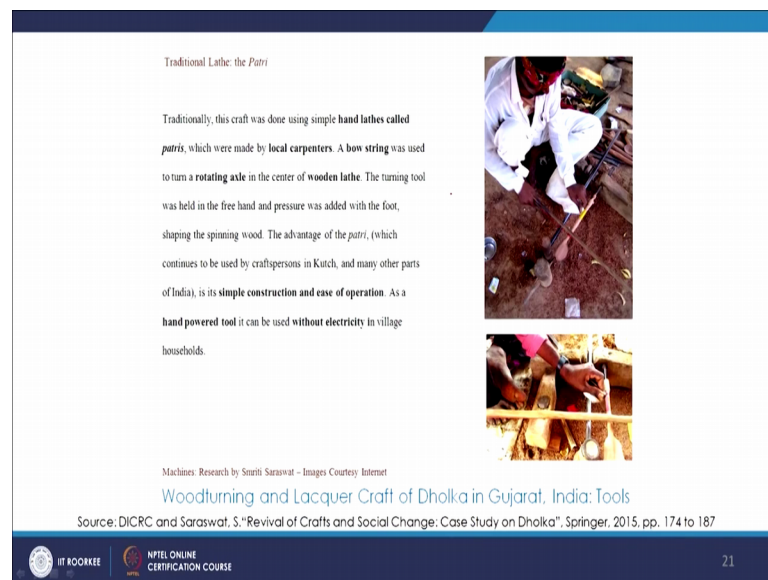
And, another thing was as I told any kind of intervention with the technical knowhow or technology which could improve the efficiency and the production and it was recorded because of that intervention how the production increased. So, all these documentations were documentation files were made. Even the tools were documented you know what are the hand tools like I told.

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So, just to understand you know how this craft form already evolved and there are still regional variations that could be seen.

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So, if we seen another craft cluster in one of the other villages of Gujarat the traditional lathe which is called as patris used and this work is entirely done by hand; so it is a very simple mechanism. It has an easy operation, it works without electricity and it works as a hand powered tool.

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- Woodturning and lacquer craft is an **indigenous craft** practiced in and around Dholka. But, now, it has **become more of a personalized occupation**, rather than being a major contributor to the craft industry or sector. Therefore, it is urgent to **introduce** the much needed **technology and innovation** to develop this cluster.
- To preserve this craft, which is already on the verge of dying in the region of Kutch, also in Gujarat. In the village called **Nirona in Kutch**, there is a very small cluster which practices this craft since generations. They still use the traditional tools and methods for turning the wood and applying lacquer. As a consequence of this, they have **not been able to meet the demands of production, and end up either in making items of personnel use or small items for market that are almost outdated**. Their economic condition is poor, and they often indulge in small jobs for earning their daily meals.
- **Synthesizing technology and innovation with their innate systems of working shall result in producing their old existing products on a larger scale.**

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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So, I was mentioning about Nirona. So, when we see this craft being practice in Nirona it is done on a very small scale because the traditional lathe, the patri, cannot accommodate different designs and huge sections of wood. It requires lot of time and the production is very less. So, this family actually a facing lot of problems and this is almost a languishing craft in the village Nirona.

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Power Lathe

Increasing market for Lacquer ware has led to the introduction of the **electric power lathe**. The power lathe is fixed at one end (the **headstock**) and the other end (the **tailstock**) can be adjusted by shifting the wooden base block. These are connected by a tie member with a sliding lock. The wooden member rotates around a spindle. The head stock consists of a revolving axle attached to two belt pulleys. The belt runs over a pulley mounted on a revolving shaft that is driven by an electric motor.

The lathe machines are **floor based** and unique in that they themselves have no moving parts.



Machines: Research by Smriti Saraswat - Images Courtesy: DICRC

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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While if we see the other cluster that we are talking about dholka. So, here they use the power lathe. So, here it is operated by weights and pulleys and the conveyer belts and the

production increases many fold the time consumption is reduced and the product range completely different and they also used bamboo instead of timber because timber is not available in that much abundance and different kinds of joinery also rather than just the traditional joinery that was used in making the baby cradle or some utilitarian objects.

So, again so, there is this technology intervention, there is technical knowhow and there is also redefining of the product range plus exploration of alternative materials. So, all that was simultaneously happening during this work shop and we were trying to understand.

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• With new improved tools and machines, they have a **wide range** of all new **products** and **designs**.

• Experiments, Collaborations and Interventions ensure that they have **work throughout the year**, and not just in few peak seasons.

• **Wood Turning and Lacquering** can be considered as a **unique carpentry-related FBSE (Forest Based Small Scale Enterprise)**. According to the **1988 document of FAO** (Food and Agricultural Organization) of United Nations, **FBSEs represent the major source of forest based employment for people in rural/semi-urban areas**. But, the nature of these FBSEs is often **seasonal and household based**. When there is no availability of alternative means of income generation, or when there is some time available outside the household activities, FBSEs provide the much needed supplemental income (Campbell, 1991)".

• The craftspersons will be able to survive the contemporary needs, will be economically strong, and have a better standard of living.

Woodturning and Lacquer Craft of Dholka in Gujarat, India

Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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So, if we see with the new improved tools and machines and with this technology intervention their product range improved and there was a wide range available now. There was lot of experiment in collaborations that resulted in interesting prototypes. Craft persons you know it allowed them to be economically strong, because the prototypes were so interesting that they already started getting the projects while we was still having workshops with them.

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- Woodturning and lacquer craft is an **indigenous craft** practiced in and around Dholka. But, now, it has **become more of a personalized occupation**, rather than being a major contributor to the craft industry or sector. Therefore, it is urgent to **introduce** the much needed **technology and innovation** to develop this cluster.
- To preserve this craft, which is already on the verge of dying in the region of Kutch, also in Gujarat. In the village called **Nirona in Kutch**, there is a very small cluster which practices this craft since generations. They still use the traditional tools and methods for turning the wood and applying lacquer. As a consequence of this, they have **not been able to meet the demands of production, and end up either in making items of personnel use or small items for market that are almost outdated**. Their economic condition is poor, and they often indulge in small jobs for earning their daily meals.
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Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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So, all of these helps because if we see Nirona they are not able to meet the demand production and the hand powered patri, the hand worked patri does not really helped them you know come up with more products which are interesting as well as the more number, the quantity. So, that way these kinds of interventions are something that will help the craft sector, this is just one example.

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Power Lathe

The craftspeople sit on a low seat and use both hands and feet when working on the lathe. The motors are placed above the work area on a rigid wooden frame. The motor turns a cotton rope which through a system of pulleys directly turns the wooden member.

The use of power lathe considerably reduces time of production, as both hands are free to operate turning tools and Electricity is not a problem in Dholka. These lathes have emerged out of their own needs and understanding of the craft, and not because of any intervention from outside.



Machines: Research by Sourit Saraswat - Images Courtesy: DICRC

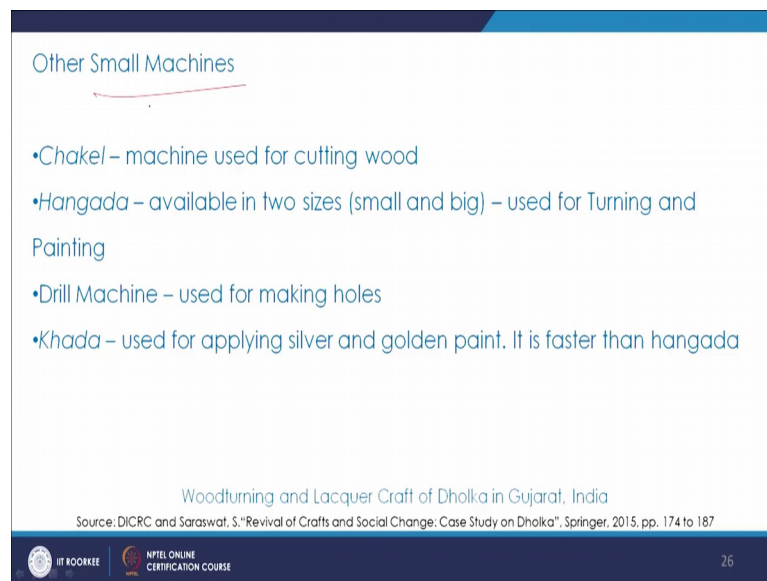
Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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So, we see some more pictures of this power lathe. It reduces time of production, both hands are free to operate electricity is not a problem in dholka. Most important thing is

that the craft persons Anil [FL] and you know his entire team they understood how it operates and in case there is a problem they do not need any outside help they can operate it on their own they can fix the problem and that is how it makes them confident, independent it reduces the time that is otherwise consumed in making the products and it increases the production it accommodates experimentation; and it result in much better quality and interesting prototypes which are also driven by the market demand.

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Other Small Machines

- Chakel – machine used for cutting wood
- Hangada – available in two sizes (small and big) – used for Turning and Painting
- Drill Machine – used for making holes
- Khada – used for applying silver and golden paint. It is faster than hangada

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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So, there are others machines also which are being used and the permutation and combination of these different machines and the power lathe actually enables the entire team of the craft persons to make interesting prototypes. So, but lastly the work is still done by the hand and feet coordination and that is how we are not snatching away from the craft persons skill set. And we are still utilizing their mind and their ability to conceive and conceptualize and design the prototypes and the products.

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a) Better Efficiency of Work and Increased Production

The production is greatly increased because of lesser time that is consumed while making products on the power lathe and machines rather than the old conventional methods. Moreover, each product that is made by the craftsmen, is still unique, and not mass produced, because it varies from the other products in scale, proportion, form, colour scheme, arrangement, assembly and function.

The table shows the distribution of work amongst the craftsmen, and the time taken in each stage. The important thing is that it reflects on the considerable amount of time saved in each stage by using machines (except in few stages where the work has to be done by hands only).

Process/Stage	Craftspersons involved and Time Duration
Storing	1 craftsman involved
Cutting	1 craftsman involved - cutting into square section to rectangular section takes approximately 1-2 hours
Turning and Shaping	2-3 craftspeople involved - depending on the section and proportion desired, it can take approximately 3-5 hours
Seed Polishing	1 craftsman involved - using lathe approximately 1 hour
Lacquering	1 craftsman involved - one glaze usually requires 40 min.
Polishing	1 craftsman involved - using paper requires approximately 2-3 min.
Painting	1-2 craftspeople involved - using paper requires approximately 1 hour
Vernishing	1 craftsman involved - working of wood panels requires approximately 2-3 min.
Assembly of Elements	1-2 craftspeople involved - one glaze usually requires approximately 15 min. for assembly
Packaging/Storage	1-2 craftspeople involved
Transporting	1 craftsman involved

Significant Changes made by Integrating Technology & Innovation in the already existing Traditional Knowledge Systems

Woodturning and Lacquer Craft of Dholka in Gujarat, India

Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka". Springer, 2015, pp. 174 to 187

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And, the here there was this record which was made and you know for all the different stages right from storing to transportation how the number of craft person involved and the time duration was drastically reduced when the power lathe was used as compared to what would have been there if the hand lathe or the traditional patris was used. So, all of this was recorded and there was major you know change in the number and like this was very efficient the interventions may did very efficient and the production increased.

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b) Explorations

The main product, which the craftsmen make is the *ghodiyo* (baby cradle). Other than this, few traditional furniture pieces are also made along with some seasonal items such as *dandiya* sticks and small drums. But, thanks to the technology and innovation, these craftsmen can now experiment and do lot more explorations, as the lathe can now accommodate larger and thicker sections of wood. The possibilities of working with the other materials can also be tested. Few experiments have already been done using bamboo, which is a cheaper material than wood.

The power lathe and the other innovated machines make it possible to achieve gentle and sharp curvatures, undercuts and successive curves of greater variety.

Woodturning and Lacquer Craft of Dholka in Gujarat, India

Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka". Springer, 2015, pp. 174 to 187

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So, these kinds of recordings were done. Also, like I told during the course of work shop we tried to do lot of explorations. So, now, lathe could accommodate large and thicker sections of wood which was not possible earlier.

So, with this technology intervention and the power lathe the more you know the thicker and the larger section wood could be accommodated and more structural prototype could be explored. Also, working with other materials so, bamboo is cheaper than wood. So, how to use bamboo some explanations were done with that and it was also possible to achieve gentle and sharp curvatures, undercuts and successive curves of greater variety. So, there was possible of possibility of having different sections again.

(Refer Slide Time: 23:04)

b) Explorations

The combinations of turned and unturned sections, grooves and forms, new kinds of joinery, and several other permutations and combinations can be tried out.

Few of these **craftspersons** are already doing such **experiments**. **Anilbhai Suthar** is one of them. He has already designed a **partition system, shelving system, exhibition panel system, units of a modular display system, staircases, railings and other space making elements utilizing the wood turning and lacquer craft to its fullest potential**. Technology and innovation have added to the skills and expertise of these craftspersons, and unlocked their design capabilities and understanding of the craft in terms of different dimensions such as space making, thus **extending the conventional forms to forge new products**.

Woodturning and Lacquer Craft of Dholka in Gujarat, India

Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

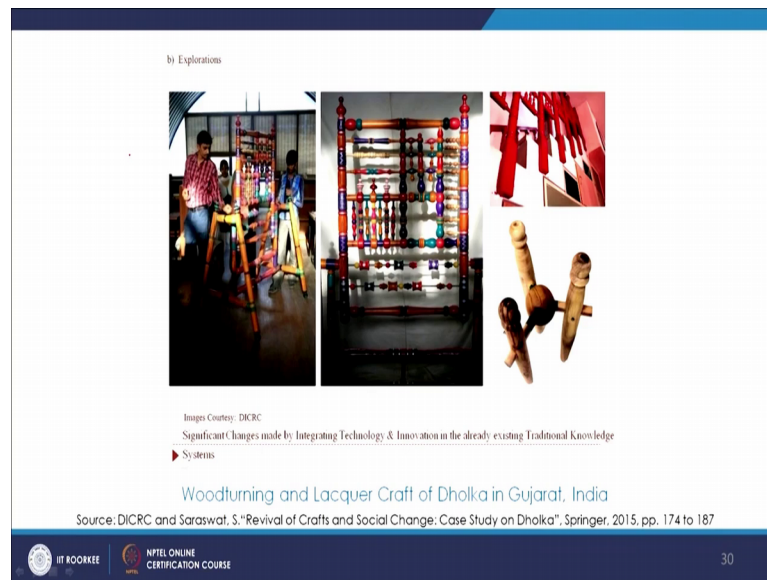
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And, then like I told some combinations of you know different kinds of joineries, permutations and combinations of grooving and forms and different massing and how the different prototypes were explored and very interestingly a partition system, shelving system, exhibition panel system, units of modular displayed systems, staircases, railings and other space making elements they were explored then the wood turning and lacquer craft.

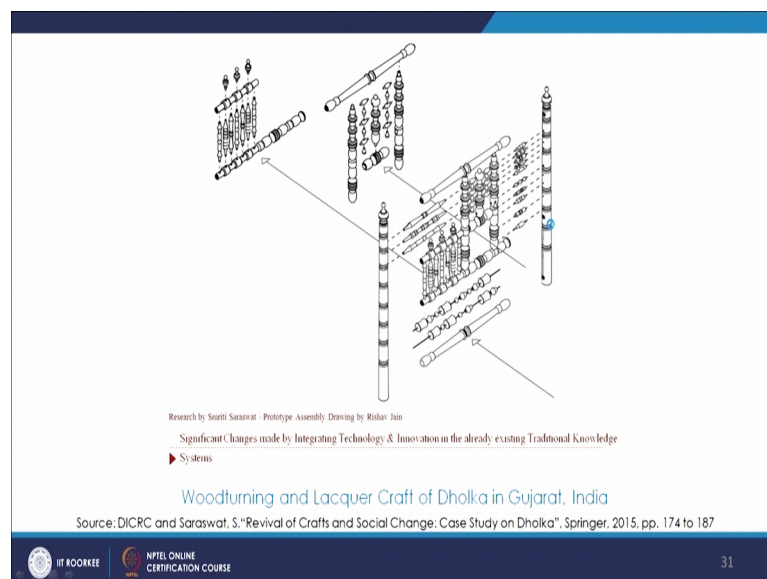
And, few of which probably I would have the pictures of not all of them, but lot of prototypes were explored. So, extending the conventional forms to forge new products which certainly is a good idea to open up a new market and let the craft survive and you know sustain.

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So, this of course, we have seen in lot of other modules, but I am discussing it in great detail today. So, again this is this partition system that was designed, this is railing that we were mentioning and the joinery again.

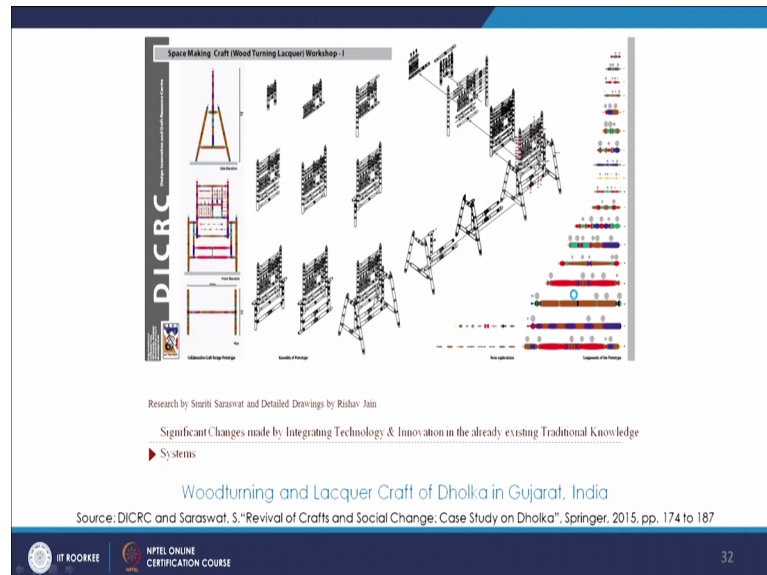
(Refer Slide Time: 24:08)



So, all those explorations along with the technology intervention and the technical knowhow intervention that completely change the situation the of the craft sector and how it has paved new ways that they are getting new projects and we are also comparing

the Nirona and Dholka just to understand what technology interventions and design interventions can you know how strongly they can make a difference.

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So, drawings were made, the team worked on it, the assembly, the entire system was understood the different sections were you know drawn with all the dimensions.

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c) Easy to Operate

The **craftspersons do not need to depend on anyone for the technical assistance** since the power lathe operates on a **simple rope and pulley mechanism**, which the craftspersons claim to have **designed on their own, out of their growing needs and changing demands**. There is no need for installing huge machinery to achieve this set up. Again, **the emphasis here is that the craftspersons still continue to work with their empirical skills in their own comfortable environment, and that the technology and innovation has simply aided their methods of working.**

Woodturning and Lacquer Craft of Dholka in Gujarat, India

Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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And, this is how installed there and like I said the craft persons do not depend for technical assistance the power lathe is easy to operate and this accommodates the growing media and changing demands of the market. So, this is a very simple I would

say incremental innovation which focuses on the technology up gradation as well as the design up gradation.

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d) Greater Opportunities and Better Standards of Living for the Craftspersons

Craftspersons are **no more** seen as **skilled labourers**. Realizing their potential and design sensibilities, **many designers from diverse fields (interior-architecture, product design, toy design, industrial design, arts, installations, craft-design etc.) have started collaborating with them on several projects.** These craftspersons have also been approached by various institutes to participate in the workshops conducted by them, and work on a common platform with students as well as professionals.

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat. S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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And, it gives confidence to the craft persons, they do not feel like just skilled laborers, but they can own up the idea the technology as well as the design.

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Need for Intervention to improve the lathe

The **existing Power Lathe** has few **limitations**. It **cannot accommodate a wooden log larger than seven feet in length**. Another thing is that it **cannot accommodate sections thinner than a certain extent**. Therefore, the products or prototypes, which could be made on it, have to be within this scope. If the prototypes such as partition screens, display systems, panel systems, decorative products, installations, other interior-architecture related designs, etc. have to be produced on a larger scale, then the power lathe will be a failure. Therefore, there is a **need for intervention** here. **NGOs, voluntary organizations, academic institutions, designers and other related stake holders can initiate this intervention, and propose new designs and operating systems for the lathe that can take care of all these limitations.**

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat. S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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So, like we were discussing to begin with why at all this intervention is required. So, like I said the initial lathe could not accommodate you know different section of wood or a particular dimension and also the production was less with the traditional lathe. So, all of

these interventions were required and this kind of gap study always helps you know what are the issues and how one could actually intervene and help and help the craft person sustain without really taking away their spirit and their ideas.

So, again continuing with the possibilities different materials were experimented like I told up the bamboo.

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Need for Intervention to make the craftspersons aware of the current market trends

There has to be a **market research about the current trends and designs**, which helps these craftspersons to open their minds and **explore diverse aspects of this craft**. One such initiative is put forth by the **Asian Paints** (not yet finalized and operational). The Indian company which manufactures paints **has shown their willingness to design one software that may assist these craftspersons to derive several permutations and combinations of colours**. They could use this colour scheme while lacquering the final products. **Other similar tools for different stages of this craft can be developed. This will support this cluster as well as the other ones.**

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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And, this is something important. So, because there is also play of color and lacquer so, a company like Asian Paints you know there was this idea the working idea that a company like this could really approach them. And you know worked with the craft persons and come up with the color pallets, which are natural pigments and then different kinds of lacquer applications you know surface development. And these kinds of explorations could be possible.

So, that kind of discussion was happening at that stage, I am not really sure what is happening now. But, there is a plenty of you know new directions and there is lot of way forward to you know create a road map that would create interesting paradigms for the craft design collaborations and these interventions.

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- Technology and innovation are important tools to understand a society, and vice versa. Therefore, the most crucial aspect is to maintain this connection. **The best possible creative innovations are probably the ones that not only lead to better production and services, but also possess social action.**
- To summarize and conclude: in order to understand the inter-relationship between technology, innovation and social change taking crafts as a conjunction; there is a **need of delving craft history and theoretical expertise; spawn and muster critical writings; develop methodologies that integrate existing knowledge with technology and innovation; disseminate them; and bring them into practice to initiate social change.**

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka". Springer, 2015, pp. 174 to 187

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So, all of this we try to understand through this workshop. Now, having discussed the different interventions let us focus on the next module on Marketing and Management Based Interventions and here are some references.

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Revival of Crafts and Social Change is the paper that I was discussing at lengths today, focusing on Dholka, the work done with DICRC, the paper also mentions DICRCs role and involvement, supply chain management; we will see more of it in the next module. Of course, the design interventions craft revival.

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Thank you.