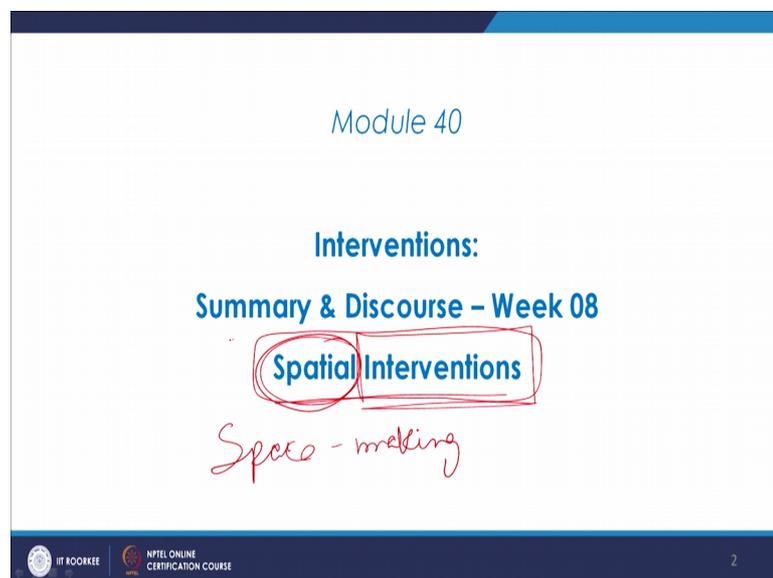


Role of Craft & Technology in Interior-Architecture
Prof. Ar. Smriti Saraswat
Department of Architecture & Planning
Indian Institute of Technology, Roorkee

Lecture - 40
Interventions: Summary & Discourse-Week 08 Spatial Interventions

Hello everyone, welcome to the NPTEL course, Role of Craft and Technology in Interior Architecture. Today we are going to discuss the last module of the course, and it summarizes all the different kinds of interventions that we have discussed so far.

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And like I told last time we will also touch upon briefly these spatial interventions. Because it is very important that we talk about space, because this course talks about building crafts and the interventions within the crafts sector, that talk about space making, and the milieu of interior architecture.

So, this is what this special section is about, so, we will be seeing that.

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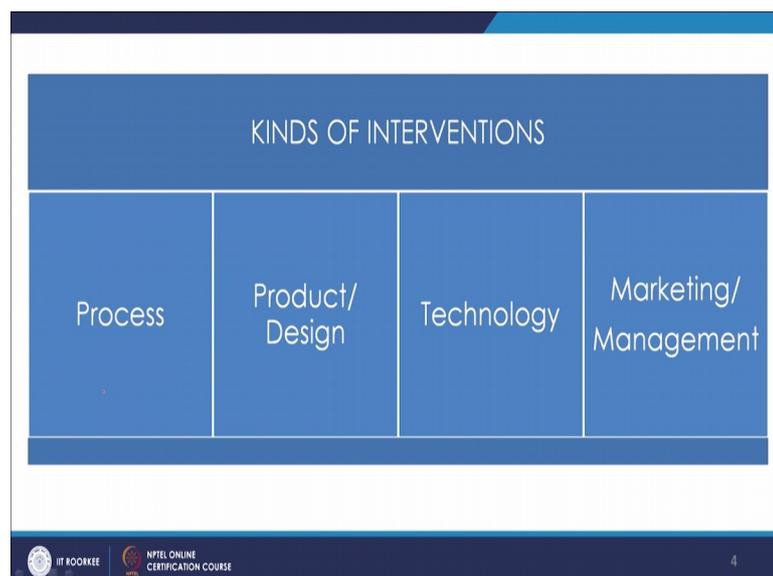
Contents

- Interventions: Process Based ✓
- Interventions: Product/Design based
- Interventions: Technology Based ✓
- Interventions: Marketing/Management Based
- **Interventions: Spatial**
- Discussion and Examples
- References

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Broadly seeing the contents for today, like of course, I just told all the different kinds of interventions that we saw process based, product or design based, technology based, marketing management based. And this special section that we will talk about it will be very brief, and I will be majorly focusing on architecture and textiles, and particularly talking about the works of architect and theorist Gottfried semper. So, we will see some examples and of course, towards the end the references.

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So, I will not be discussing in detail there are lot of visuals and I will be flipping over what all we discussed. So, basically we had this 4 classifications under the umbrella of kinds of interventions, and we discussed about them 1 by 1.

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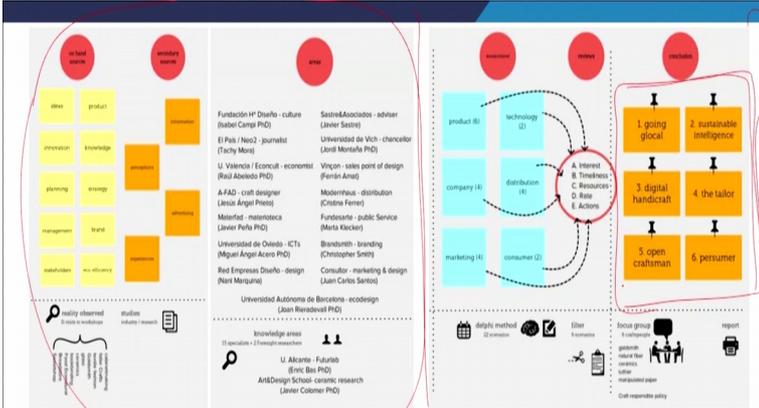
The open craftsman: sharing experiences in an everyday setting.

"This vision enables the strengthening of local communities (artisans, local agents, suppliers and distributors), gives greater importance to space (both virtual and physical), facilitates the sharing of ideas and knowledge (online and in person), creates opportunities to work with other professionals (in a collaborative setting) and serves to eliminate technological barriers (with technology providing support). Optimal learning occurs when people have the opportunity to explore the world for themselves, but in a guided fashion. When people actively create things in the physical world, they are able to construct knowledge in their minds much more easily."


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So, we started with the process based interventions, and we tried to understand the concept of the open crafts man, there lot of focus is given to the local communities, and the sharing of ideas and knowledge is encouraged.

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This method requires, on the one hand, a prior overall analysis of the industry, with which a representative sample can be taken of the different sectors which make up the industry in Spain; on the other hand, a study of the environment is essential in order to be able to understand and taken into account variables which have a direct or indirect influence on the system.

Source: Toran, M.M., Sendra, C.E. and Cuesta, R.M. "Scenarios for design and craft", Design for Next, EAD 12 – Rome, Sapienza University of Rome, 12-14 April 2017


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We also tried to understand this case from Spain, you know where this methodology was adopted, where on one hand the overall you know in mentrization and understanding of the existing industry was taken into concern and then here. On the right hand side, there was there was this mix of constant and variables and different craft design scenarios was established to understand you know how the you know how by playing with this constant, and variables different craft design scenarios can we worked upon and explode, so, we saw this case study.

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Craft-Design Process

In India the **craft and design sectors share a symbiotic relationship**. Through **craft the designer connects with the natural world and the collective past**.

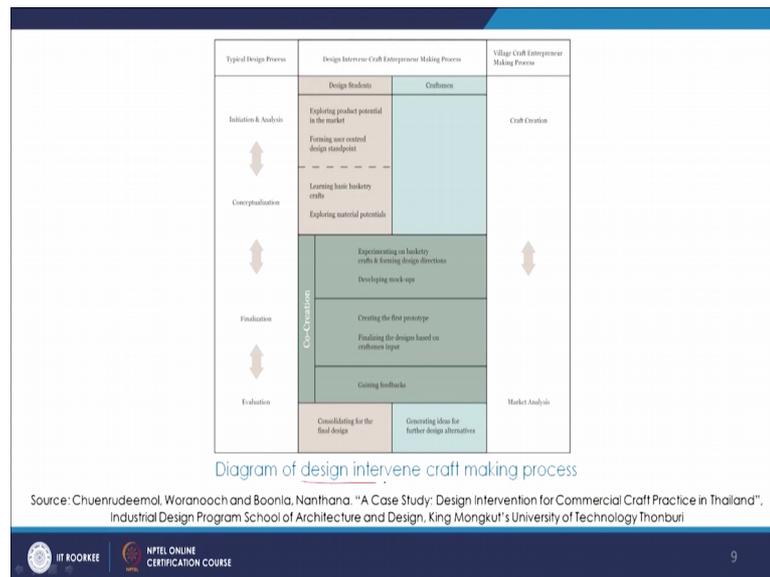
Traditional **craft skills are adapted to contemporary design** (Sanjeev Kumar and Nandini Dutta-2011). **Designers bridge the gap between the market and the artisan**, as today the artisan is geographically apart from his/her client, to be able to understand his/her aesthetic and socio-cultural needs.

Designers help in finding the relevance of craft with respect to the artisan, the consumer and to the global market. **Designers are thus an interface, between the past and the present, the traditional and the modern, trying to match craft production to the needs of modern times and demands** (Sethi, 2005).

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We also try to understand the very important craft design process and what is the craft design collaboration all about. And you know how craft and design sectors they share a very symbiotic relationship, and while the craft person's posses the profound knowledge of material and you know, they have their skill sets. Designer also gives lots of design inputs and also tries to connect the craft persons and the, you know communities to the markets. So, that kind of collaborative process we saw.

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We also tried to understand the design intervene craft making process, which focus is essentially on co creation, and not just this typical linear process you know from the initial stage to the final a stage of product delivery and evaluation. But you know what how the co creation happens and how the exchanges of ideas happen, so, we understood that.

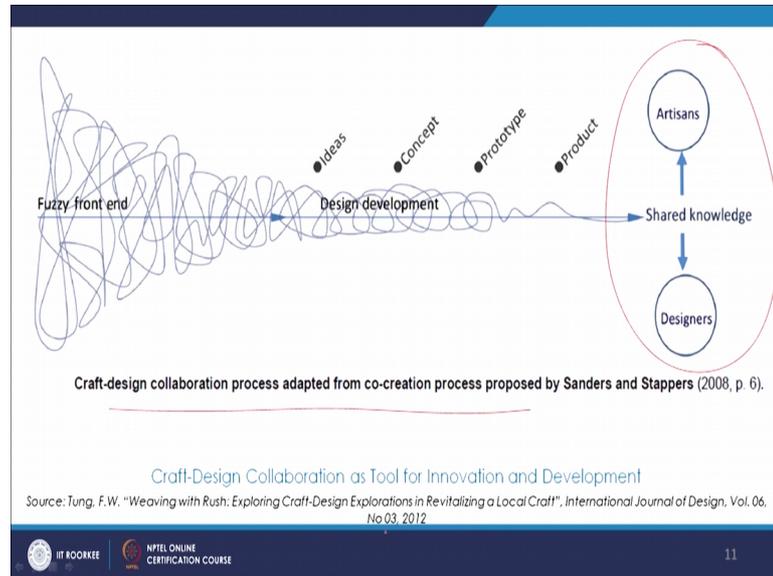
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Craft-Design Process

Collaborative innovation between designer and craftsman is a means of expanding the craft vocabulary and tapping contemporary markets. It is also argued that a link between the apparently conflicting tenets of sustainability can be achieved through responsible and strategic design innovation which integrates the social, economic, ecological and cultural aspects. (Rebecca Reubens 2010)

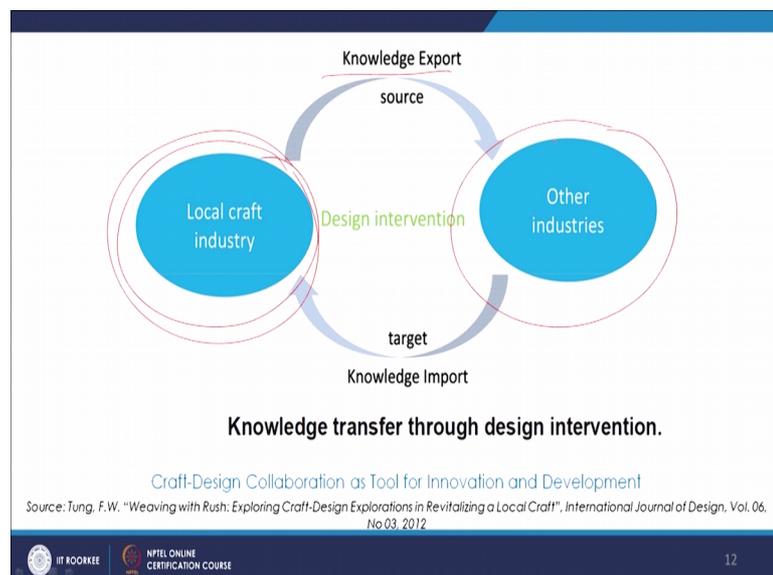
Continuing over discussion with craft design process, we will try to understand the importance of establishing collaborations, and you know, how that collaboration helps in expanding the craft vocabulary and creating new markets.

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So, that was the discussion on craft design process and taking case studies again to understand it further we again tried to understand the importance of co creation, where artisans and designers work together with the shared knowledge, and work towards achieving a certain goal.

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Then there are lot of knowledge exchange that happens between the local craft industries other industries, and there is import and export of knowledge from one side to the other, and how design interventions play a crucial role.

You know, in connecting the 2 of them and the different kinds of interventions leading to the completely new way of looking at the craft sector. So, we tried to understand that to understand the process based interventions.

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Process (and product) based intervention: Aepan

The blend of Aepan design with appliqué is providing an imaginative and fresh collection to the people who want to adopt their tradition with minute modernization. Adapting and improving the designs refers to modify it such that it will be easier to produce, easier to use, or easier to fix, or easier to maintain so on. With the changing world of fashion the field of textile demands for unique, different and fresh designs which give us the opportunity to use the adapted traditional motifs.

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We also saw one example focusing on the Aepan heart of Uttarakhand, and then we saw how the blend of Aepan design with applique is providing very imaginative and fresh collection to the people who want to adopt their tradition with some modernization in contemporary expressions.

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[Vijai et al., V, Vol.2 (31-3), September, 2015] ISSN: 2188-8538(E) ISSN: 2184-8258(P) Impact Factor: 2.015 (2015)

CA1*	CA2	CA3	CA4	CA5	CA6	CA7
CA8	CA9	CA10*	BuA1	BuA2*	BuA3	BuA4
BuA5	BuA6	BuA7	BuA8	BuA9	BuA10*	
BA1	BA2*	BA3	BA4	BA5*		
BA6	BA7	BA8	BA9	BA10		

Note: CA- Adapted Centre Motif BuA- Adapted Right Motif BA- Adapted Border Motif

MH 1	MH 2*	MH 3	MH 4	MH 5	PP1	PP2
PP3*	PP4	PP5	SB1	SB2	SB3	SB4*
SBS	BP1	BP2*	BP3	BP4	BP5	

Note: MH Mobile Holder, PP Pencil Pouch, SB Sling Bag, BP Back Pack
*Selected Arrangements

Adaptation of Original Motifs on Fabric through Applique Work - Design Arrangement for Different Bags.
Incorporating Aepean Motifs
Source: Chuenrudeemol, Woranooch and Boonla, Nanthana. "A Case Study: Design Intervention for Commercial Craft Practice in Thailand".
Industrial Design Program School of Architecture and Design, King Mongkut's University of Technology Thonburi

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So, we saw this example where the adaptation of original motifs on fabric through applique work is done and different product ranges developed for new market, we saw such examples.

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Design outcomes generated by Baan Aoy craftsmen - The villagers have applied the idea of sustainability to the way in which they approach their craft business model, by replacing vetiver grass with their local agricultural waste which is plentiful and accessible in the area. Where earlier the locals looked to outsource certain non-local materials, they have now learned to aim for craft designs that are hundred percent made in Baan Aoy. In essence, they have achieved great sustainability and profit by learning to maximize their production and marketing capability by utilizing local resources and labours. Lastly, the Baan Aoy project has taught the students and the villagers the importance of self-reliance as the main ingredient towards achieving sustainable commercial success.

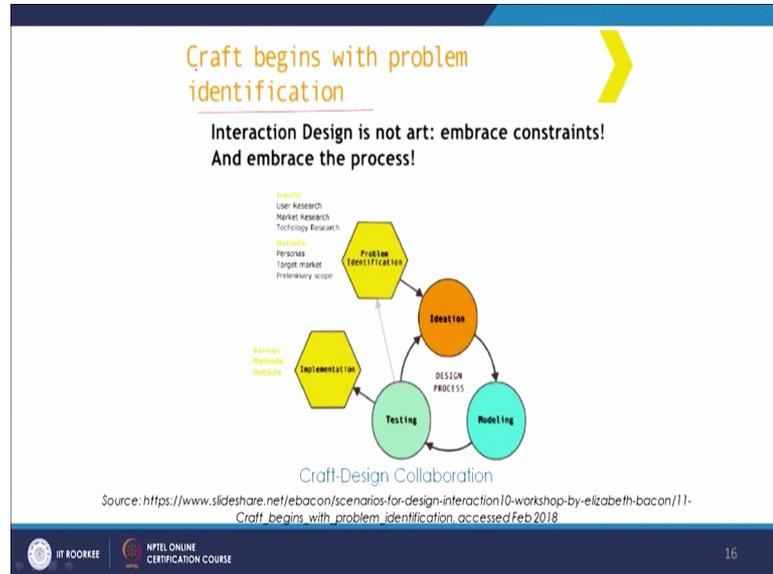
Source: Chuenrudeemol, Woranooch and Boonla, Nanthana. "A Case Study: Design Intervention for Commercial Craft Practice in Thailand".
Industrial Design Program School of Architecture and Design, King Mongkut's University of Technology Thonburi

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We also saw this very interesting case study from Thailand; where you know the craft a persons adopted by a sustainable ways, and they tried to work with natural resources and the you know natural naturally available materials that they had and completely redefine

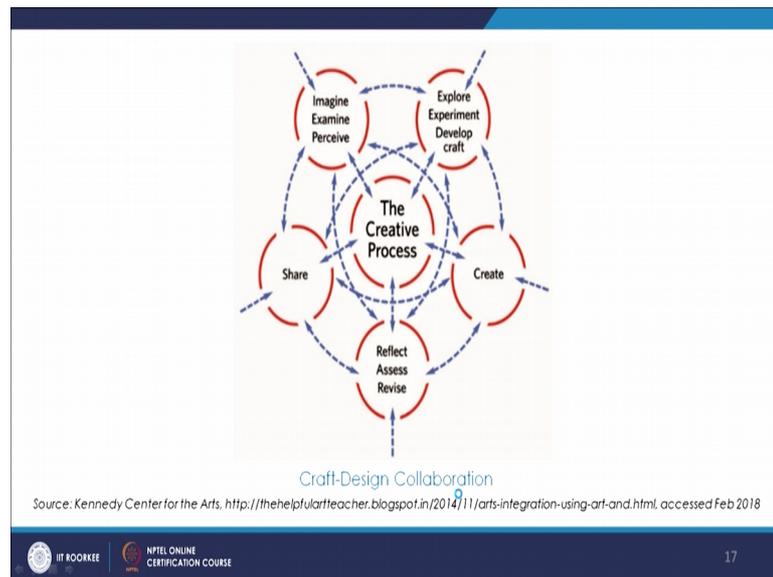
their product range and also the way of looking sustainability, by utilizing these naturally available resources and not relying on the market based raw material.

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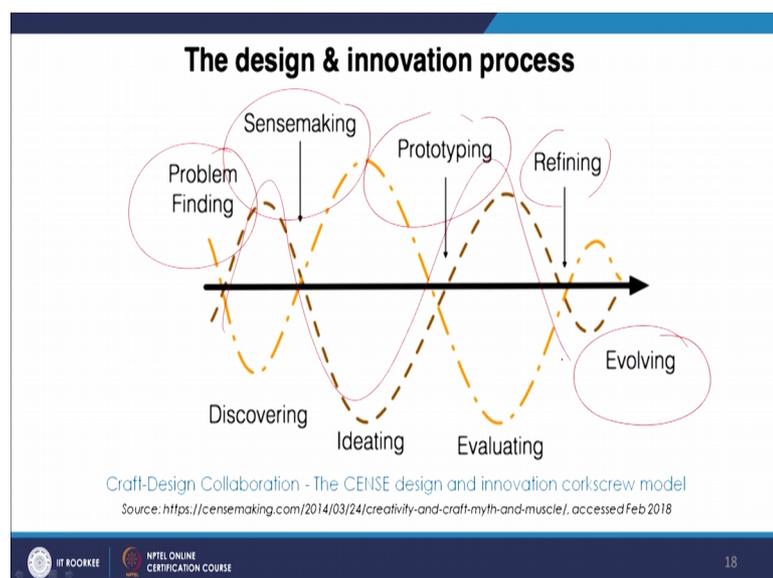
So, this was again an interesting example, we were also trying to understand the different processes, and we were to see you know how different diagrams and different existing literature explains the different processes involved with craft. So, like what we saw the craft design collaboration and a co creation process we also saw another diagram, you know, where it emphasize the craft begins with problem identification, and then it leads to further stages. So, we saw such process diagrams to understand the you know craft design collaborations in craft sector

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We also saw this creative process, how it is you know nurtured through the set of different activities; which are inter connected to each other and they all contribute and then this process is actually, you know, taken a head and we were trying to understand design innovation process, where we could see that you know it is not a linear process, starting from problem finding to some final evolving, you know.

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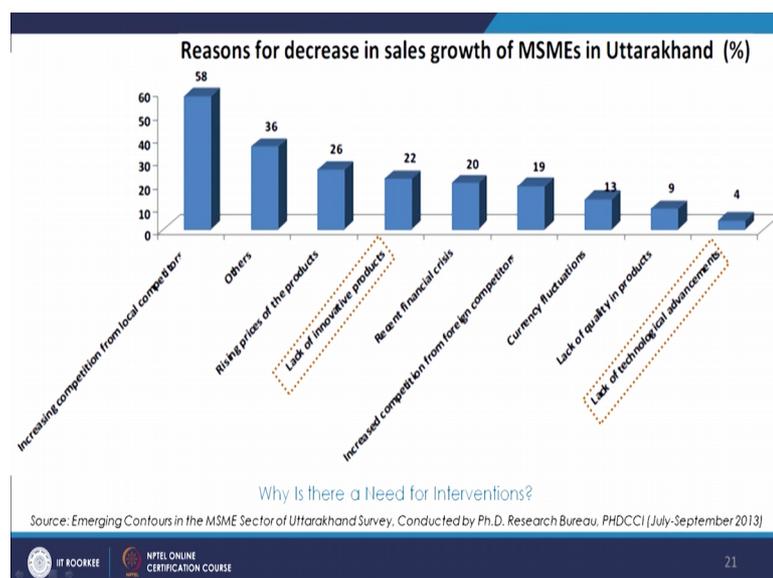
But there are in between stages and then there are curves, you know. So, it is a process again it involves different stages.

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We saw this very interesting example of craft design collaboration between dicrc and craft canvas, and how this modular storage system has been designed. So, the designer and the craft persons work together, with a traditional craft form of wood turning and lacquer work, and they tried something very contemporary. And they explode this, and after that we tried to have a look at the product and design base interventions.

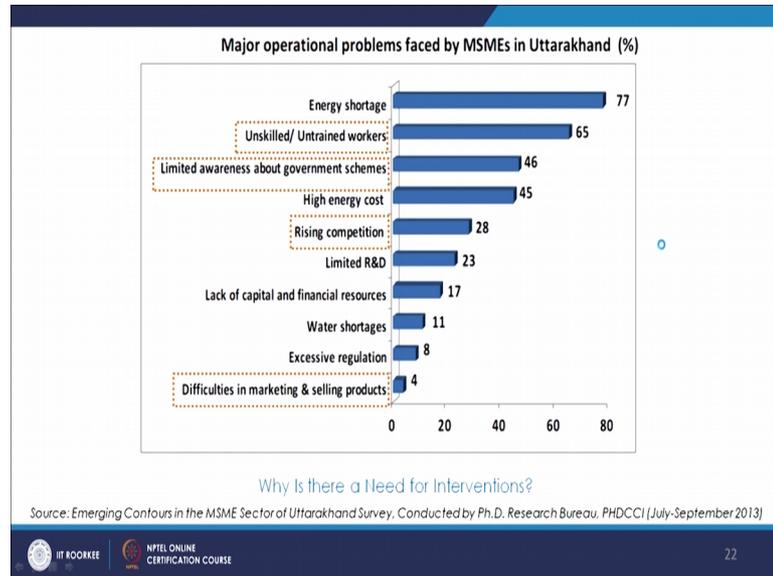
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And before actually seeing those interventions, we tried to understand you know what are the issues and challenges, and what are the problems with the existing craft sector,

and then there was this emphasis on lack of innovative products and of course, lack of technological advancements because we are going to see also the summery of what we saw within the technology intervention part.

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And again lot of data and charge they highlight, you know the marketing related issues and of course, the issues related to the product development.

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SWOT analysis of MSMEs in Uttarakhand

Strengths	Weaknesses
<ul style="list-style-type: none"> Abundance of natural resources Close proximity to high demand markets Availability of cheap labour force Low manufacturing costs Favourable government policies 	<ul style="list-style-type: none"> Highly fragmented sector Low productivity Technological obsolescence Lack of awareness of business opportunities Inadequate exposure to international environment
Opportunities	Threats
<ul style="list-style-type: none"> Emerging economy & expansion Initiation of overseas collaborations Special policies developed for the sector Achieve economies of scale through diversification 	<ul style="list-style-type: none"> Stiff competition from global players Loss of export competitiveness due to currency fluctuations Product substitutes due to fast changing technology

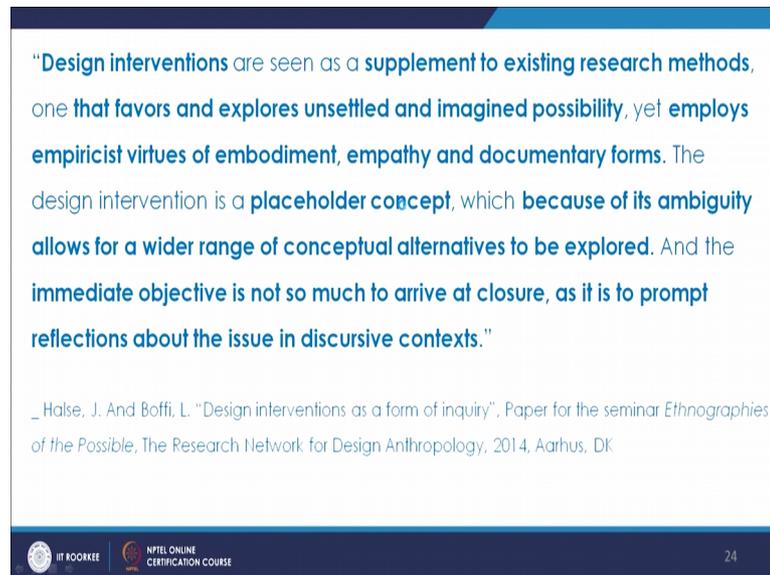
Why Is there a Need for Interventions?

Source: PHD Research Bureau, compiled on the basis of various inputs, received from the respondents

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And again we saw here from weaknesses, so, we tried to understand all of this, and which led us to the understanding, that you know design interventions are quite necessary and need of the art.

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"Design interventions are seen as a supplement to existing research methods, one that favors and explores unsettled and imagined possibility, yet employs empiricist virtues of embodiment, empathy and documentary forms. The design intervention is a placeholder concept, which because of its ambiguity allows for a wider range of conceptual alternatives to be explored. And the immediate objective is not so much to arrive at closure, as it is to prompt reflections about the issue in discursive contexts."

_ Halse, J. And Boffi, L. "Design interventions as a form of inquiry", Paper for the seminar *Ethnographies of the Possible*, The Research Network for Design Anthropology, 2014, Aarhus, DK

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So, to understand design interventions what they actually mean we tried to understand the existing literature and different models that are into you know play, and how design interventions are completely they just give a very new way of looking at the existing products. And they redefine the craft sector and they also open lot of you know opportunities which are untapped. So, we try to understand that and get a hang of things about what design interventions actually mean.

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We saw some case studies we saw the Kala Raksha Vidyalaya, and how it has really you know progressed and evolved and the craft persons there are; living sustainably with their craft forms also open to the interventions the new prototypes and products and designing everything which is demanded by the market. So, that was the one case study which we studied, and we also tried to you know understand the problem. So, like generally these designer meets artisans model is practice, but what are the problems was explained through the case study of Kala Raksha and the founder, you know, where the craft person is just reduced to a laborer and designer just comes and instructs what to do. So, that is where this model fails, it has to be a creative liberty and collaboration.

So, we try to understand those kinds of problems and what this case study and model you know serves best so, that you know there are lot of learning from it.

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Interventions: Case of Kala Raksha Vidyalaya, Kutch (Gujarat, India)

Source: Das, P. "Kala Raksha Vidyalaya". 2014. https://issuu.com/poorvimalthur/docs/a_case_study_in_innovation_of_kala_ accessed Feb 2018

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So, interesting a examples how the digital portfolio of a rich craft person is maintained, and then communication, and identity building is done through the online portal, and you know, interesting new technologies web based technologies are incorporated.

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Interventions: Case of Kala Raksha Vidyalaya, Kutch (Gujarat, India)

Source: Das, P. "Kala Raksha Vidyalaya". 2014. https://issuu.com/poorvimalthur/docs/a_case_study_in_innovation_of_kala_ accessed Feb 2018

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And then there are lot of ways to disseminate, and you know, exhibit and have a outer reach of all the products, and where the artisan and the craft person are also participate in this dissemination and this gives them confidence.

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New explorations combining traditional craft processes in commercial space making (interior architecture) applications are also gaining attention. Craft, design, and interior architecture have been included in the list of UNESCO's 'creative and cultural industries (Florida, 2002; Howkins, 2001; UNESCO 2009), are generating employment and contributing to the world economy (United Nations, 2004) and Gross Domestic Product of many nations (EY, 2014). **Craftspersons' knowledge and modelling skills are being linked to the cultural and creative industries, entangled with new design perspectives, and applied to prototyping, especially in space-making applications.**

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So, we also tried to understand different kinds of new explorations, you know, where the traditional craft processes are combined with contemporary ways, and there also integrated in commercial space making applications, so, those kinds of explorations are happening. And craft person's knowledge and modeling skills are now being linked to the cultural and creative industries.

And there is this whole new range of ideas, and you know, new platforms that are emerging we discussed about this we also saw some you know.

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Tradition leading to Continuity

Evolving Expressions through Time, Space and People

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A examples where there is the intervention in terms of contemporary a expression altogether or in terms of technique and joinery, starting from the existing product to the final new product, and a different medium to express through that craft form that we came across, we saw some examples of building crafts.

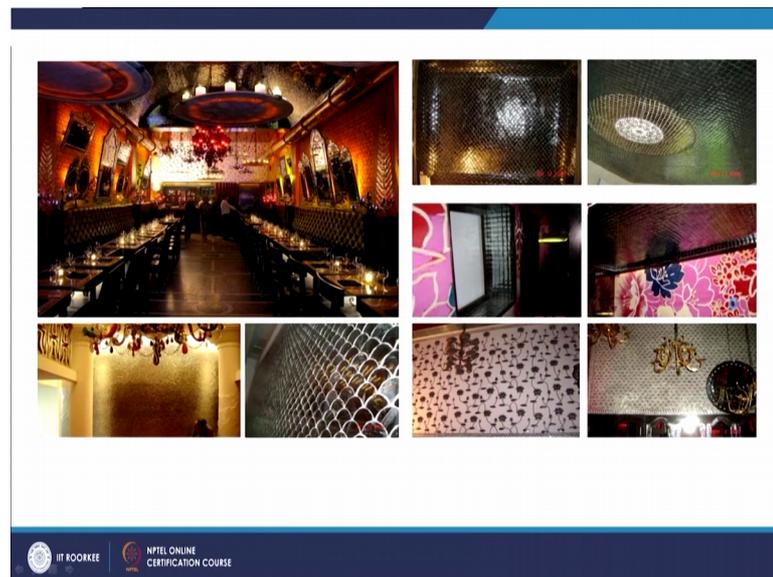
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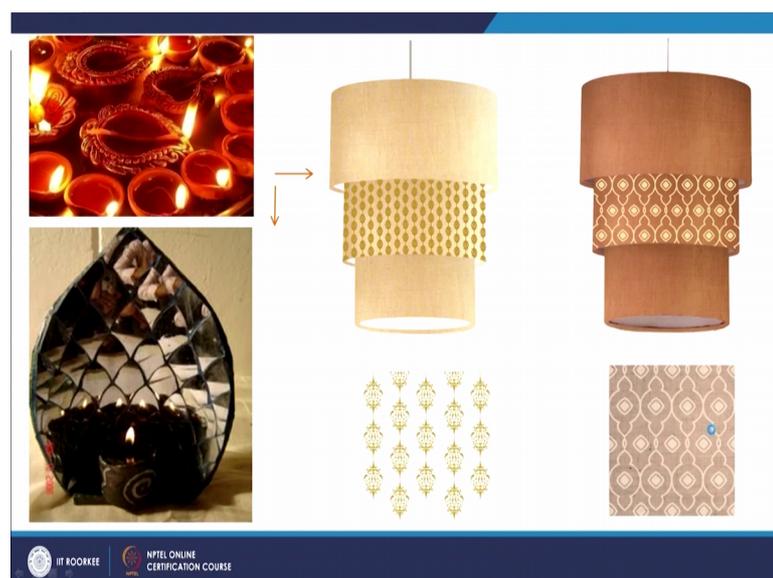
And how the product interventions has happened, and how a particular thing was used earlier and what are the different ways of using it now.

So, we saw some example of Thikri Kaam also, you know, how it was done earlier and now it is completely different expression, some more examples of application.

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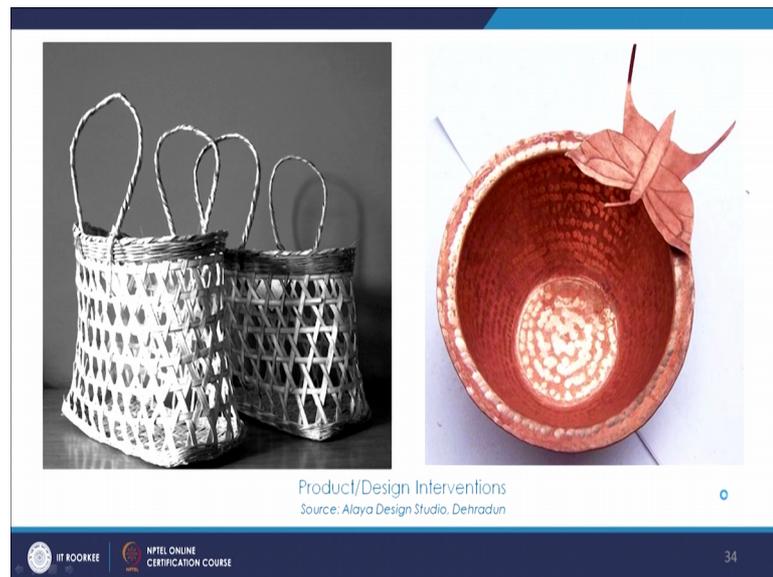


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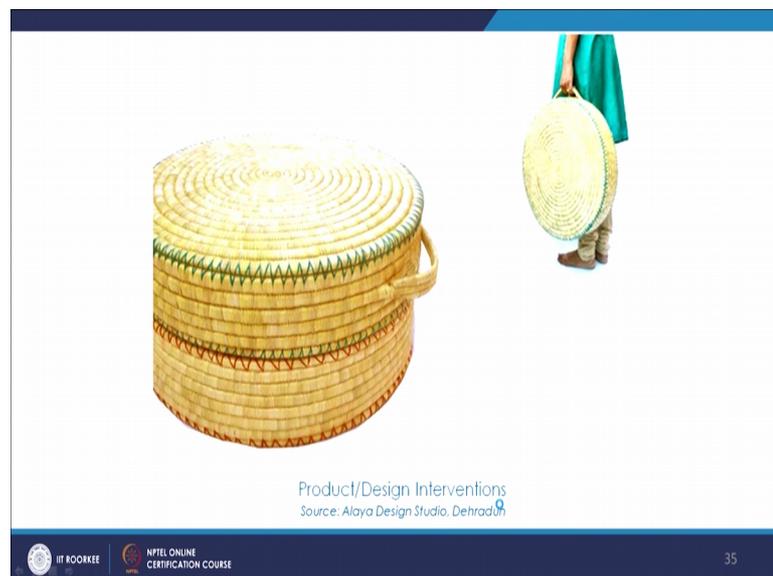
And we saw some more you know, making of products; where the idea is very rooted to the tradition, but the form and expression has changed, and the material exploration is also new.

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And we saw some product interventions which are done by Alaya designs studio.

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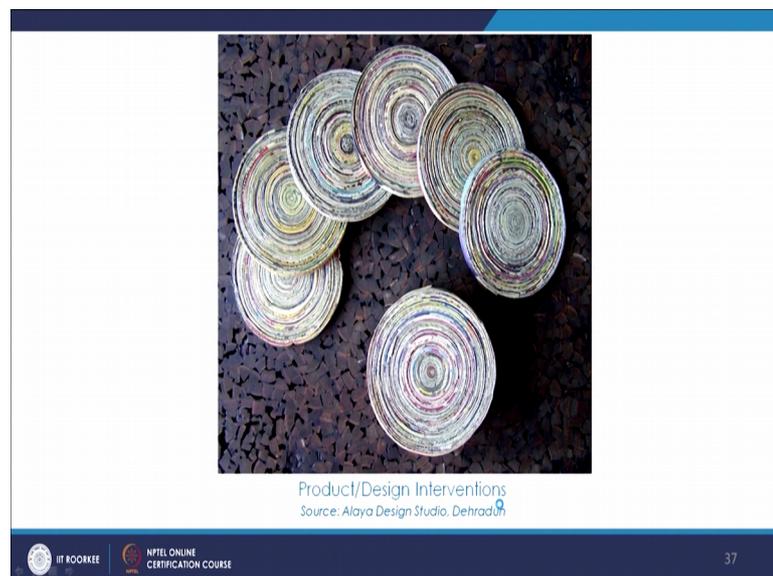
And we just went through them, and tried to understand wow what they have doing with the different a craft persons.

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And they are coming up with this new vocabulary of completely new product range.

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So, we see all these here on the slide, all that we discussed the other day.

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Again some of them are like very naturally available materials and very ecological. So, we saw all these products, some interesting interventions there. Then we progressed towards the technology based interventions.

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And we tried to understand how integrating technology is having a major impact on redefining the craft sector. And how it is improvising the production and sales, and giving chances to you know craft persons for better standards of living, we tried to understand that.

And we also tried to understand, when we talk about technology intervention, what kind of factors are in play, what are the major considerations.

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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, product consumer market, and then this whole new interest in making an craft products where the completely different vision, and democratization of design do it yourself culture promoting sustainability, all these important aspects.

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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

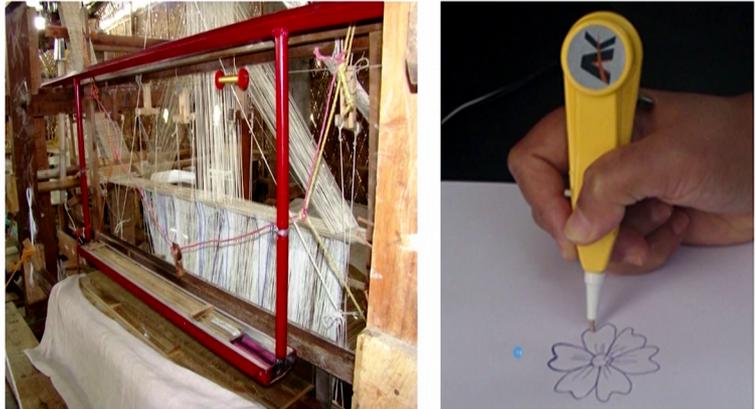
□ The promotion of ethical approaches advocating sustainability, ecologic use and local production and development.

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

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When we saw the case of European crap craft revival, and try to understand how they also emphasize on technology interventions; and focus on digital fabrication, and you know, digital technology, we tried to see that.

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The slide contains two side-by-side images. The left image shows a traditional wooden loom with white threads, used for weaving. The right image shows a hand using a yellow, handheld stencil cutting device to cut a flower-shaped stencil from a white sheet of paper.

Design Making By Weft Insertion, Deepak Bharali
5th National Grassroots Innovation Awards

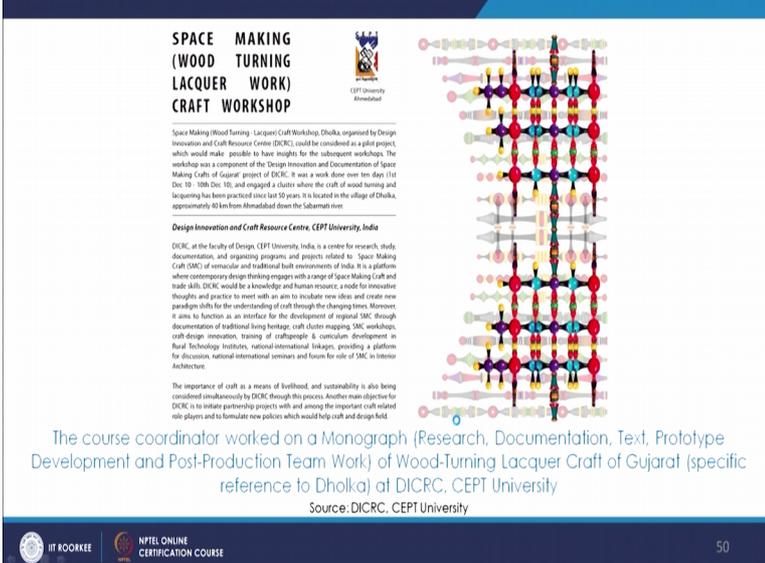
Stencil Cutting Device, Shaikh Md. Nazim
5th National Grassroots Innovation Awards

Source: http://nif.org.in/technology-catalogue?tech_cat_type=38&tech_cat_name=&search=Submit

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We saw some examples from national innovations foundation, where some innovation has been taken care of.

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The slide features a title 'SPACE MAKING (WOOD TURNING LACQUER WORK) CRAFT WORKSHOP' on the left. To the right is a diagram of a lacquer craft structure, showing a grid of colorful beads (red, blue, green, yellow) connected by thin lines, forming a complex, multi-layered pattern. Below the title is a paragraph of text describing the workshop and the center. At the bottom, there is a paragraph about a monograph project and the source.

**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 to 10th Dec '16), and engaged a cluster where the craft of wood turning and lacquering has been practiced since last 150 years. It is located in the village of Dholka, approximately 42 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 centre for research, study, documentation, and organizing programs and projects related to 'Space Making Craft (SMC) of emulative 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 mode for innovative thoughts and practice to meet with an aim to inculcate new ideas and create new paradigms skills 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 Institute, 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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And we saw this example from Gujarat and very step by step we had discussed, you know, how the little technical low how an intervention at small levels as really improvise

this craft community and their ways of living specifically few of them which were particularly open to new ideas.

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Identified Craft Cluster



• Dholka or Dholaka is the headquarters of Dholka Taluka in Gujarat. It is located about forty kilometres to the southwest of Ahmedabad city, down the Sabarmati River.

• Dholka is majorly an agriculture based economy, and the leading industries here are cotton related such as the production of cotton textiles, cotton ginning and pressing. Other sectors of income generation form a minor part of Dholka's economy.

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC, CEPT University

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And how the explorations with new materials with different kind of joinery in different kinds of product range, and a along with the these product and design interventions there were also interventions in the lathe on which the wood is turned and how it has drastically improved the production.

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Craftsperson Himmatlal Mistry
Experience: 35years

Craftsperson Anilbhai Suthar
Experience: 18years

Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC, CEPT University

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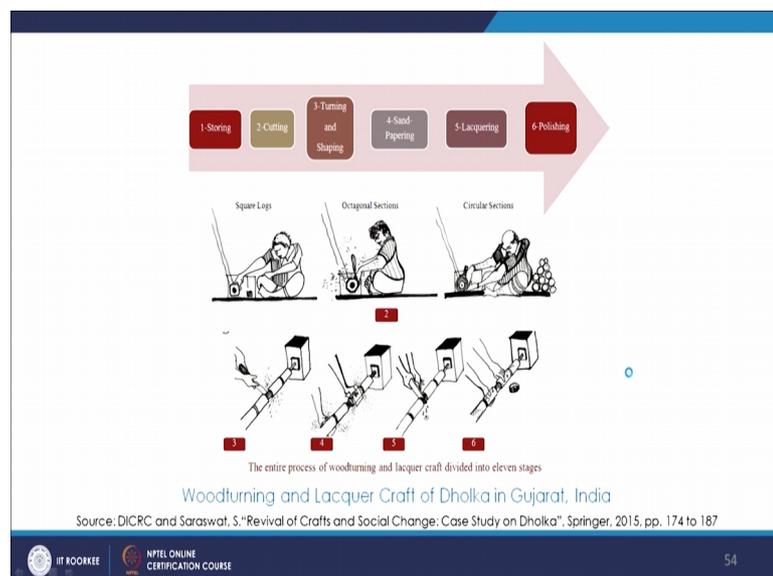
So, all that we discussed we discussed, the case of this craft form and we discussed about the craft persons particularly involved.

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How they work? What are the different machines they use? What is the space that they use?

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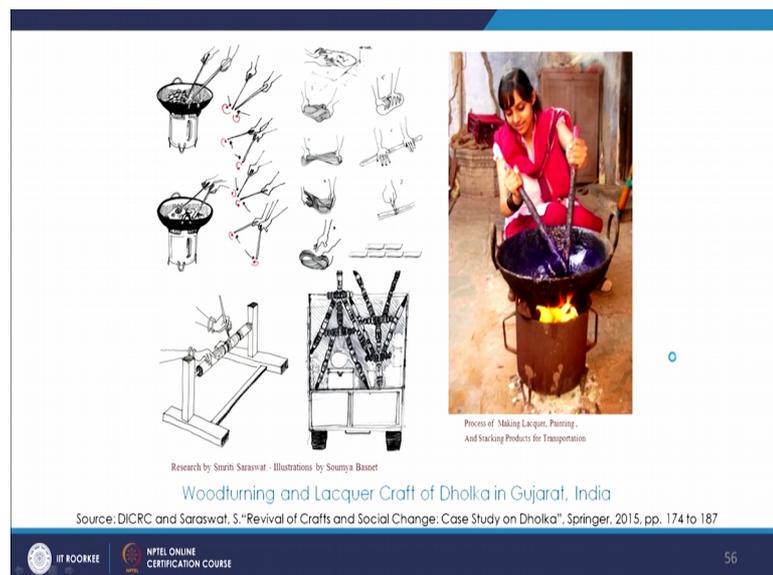


What are the different stages in which this craft, you know take shape?

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And then at each particular stage, how things are done it was a explained through illustrations also the making of lacquer and then transportation, all that was discussion.

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Research by Smriti Saraswat – Images courtesy DICRC

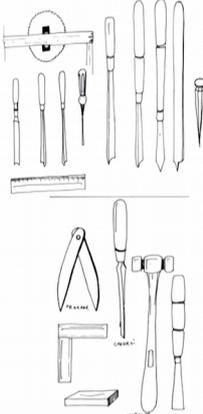
Woodturning and Lacquer Craft of Dholka in Gujarat, India: Existing Products

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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Nakhlan (Gonges) – used while turning wood- 1" blade
Chaursi (Chisels) – for finishing, while turning wood – 1" blade
Kans – for supporting sections of wood, while turning them
Sainiyun – for making grooves
Prakkar (Compass) – for measuring radius, marking
Animaar (Awl)
Hathandi (hammer) – small and big – used for beating and nailing
Kanch Paper (sand paper) – used for finishing
Sanyia – Needle used for supporting dadham (component of ghodiyu)
Panch Keela – used for joining buks
Vindni Pharsi – used for making holes



Hand Tools: Research by Smriti Saraswat - Illustrations by Soumya Baiset (DICRC)

Woodturning and Lacquer Craft of Dholka in Gujarat, India: Tools

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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Traditional Lathe: the *Patris*

Traditionally, this craft was done using simple hand lathes called *patris*, which were made by local carpenters. A bow string was used to turn a rotating axle in the center of wooden lathe. The turning tool was held in the free hand and pressure was added with the foot, shaping the spinning wood. The advantage of the *patris*, (which continues to be used by craftspersons in Kutch, and many other parts of India), is its simple construction and ease of operation. As a hand powered tool it can be used without electricity in village households.



Machines: Research by Smriti Saraswat - Images Courtesy: Internet

Woodturning and Lacquer Craft of Dholka in Gujarat, India: Tools

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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Their existing products range was discussed, the tools that they work with were also discussed. And we tried to understand you know, that there are 2 clusters who practice the same craft form, one is in Dolka the case study that we did in detail, and the other one is Nerona and we saw the regional variations, and how one clusters is flourishing while other is almost languishing because they have not really taken into account the up gradation part. So, while one in nerona still uses the Patris the traditional lathe, which is completely done with hands and it can accommodate only small scale products.

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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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And it is time consuming so, they have been facing lot of problems with production, while the other one in Dolka they have agreed to the technology intervention and they use the power lathe which minimizes the time consumption.

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Power Lathe

The craftsmen 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 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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And increase the productivity, and also accommodate it is larger and thicker success of wood allows from material exploration, and also gives way to experimenting you know with different forms and joinery.

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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
Steering	1 craftsman involved
Cutting	1 craftsman involved - cutting one square section to rectangular section takes approximately 1.5 hours
Turning out	2-3 craftspeople involved - depending on the section and proportion desired, it can take approximately 3-5 hours
Shaping	1 craftsman involved - one person approximately 30 min
Sand Papering	1 craftsman involved - one person approximately 30 min
Lacquering	1 craftsman involved - one person usually requires 40 min
Polishing	1 craftsman involved - one person requires approximately 2-3 min
Painting	1-2 craftspeople involved - one person requires approximately 30 min
Varnishing	1 craftsman involved - one person usually requires approximately 2-3 min
Assembly of Elements	1-2 craftspeople involved - one person 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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So, that kind of discussion was done to understand that how by technology intervention. The efficiency is drastically increase the time duration at each stage is reduced the number of craft persons involving at each state a stage as minimized, and the overall productivity you know goes high.

(Refer Slide Time: 17:01)

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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So, that was discussed in different explorations in joinery and forms, and different kinds of prototypes that were done they was. So, interesting there were already projects coming in for these craft persons.

So, that again sort of reach to the market, and there was demand and there was lot of experimentation that happened, because of these different interventions be it design or be it the technology both of them actually played an important role.

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by Explorations



Images Courtesy: DICRC
Significant Changes made by Integrating Technology & Innovation in the already existing Traditional Knowledge

► Systems

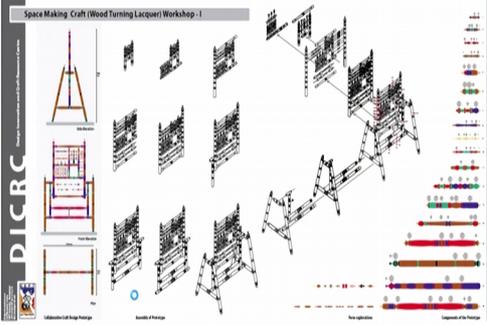
Woodturning and Lacquer Craft of Dholka in Gujarat, India
Source: DICRC and Saraswat, S. "Revival of Crafts and Social Change: Case Study on Dholka", Springer, 2015, pp. 174 to 187

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So, that kind of discussion we did and different kinds of explanations we saw, which emerged out of the workshops that happened as craft design collaborations between the craft community and the dicrc accept university.

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Space Making Craft (Wood Turning Lacquer) Workshop - I



DICRC

Research by Smriti Saraswat and Detailed Drawings by Riskav Jain

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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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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So, we tried to understand this important aspect of intervention, and how important it is to work hand in hand with the craft persons, and how important it is that they are also receptive to the new ideas so, we understood that.

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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 yeah we tried to understand what was the need for this interventions, and while they were actually introduced, and how drastically they improved the cluster.

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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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Then we moved on to the market and management based interventions and we quickly tried to understand that there is this new trend, where you know mass customization is emphasized upon.

(Refer Slide Time: 18:13)



"The new trend of innovation and value creation should rely on mass customization and innovative products and services instead of reducing costs and increasing efficiency (Hughes, 2013)."

- 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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And how design is no more and isolated activity, and it requires lot of plugging in from different other disciplines and sources, and it is important to also take into account the design management part and finally, of course, the marketing the product.

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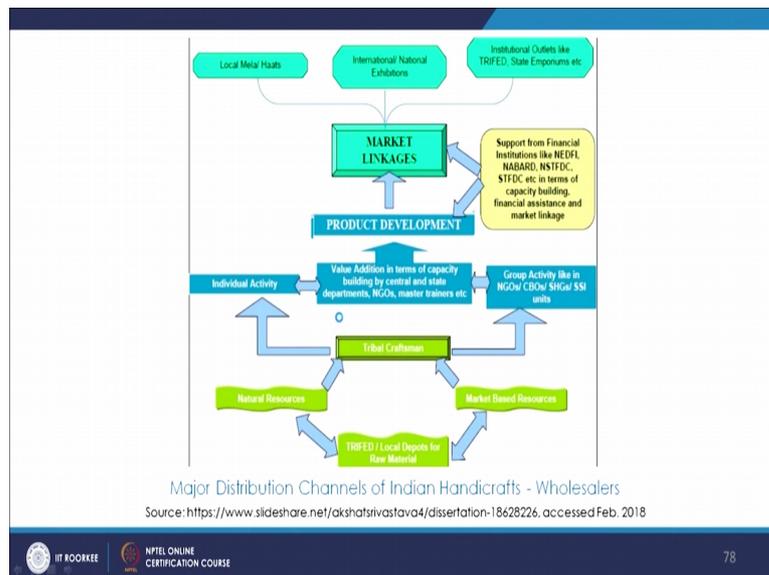
"Market Interventions: targeting markets from the high, middle and low ends; from the local, domestic to the international; from the mass to the niche. Here, each level of the market would require valuable products that integrate craftsmanship with contemporary creativity. Market value standards could be based on the degree of: 1) inheriting traditional techniques and materials, and 2) innovating techniques, materials and design. To realize these directions, there would be a need to establish standards of entry for the domestic market. Another approach to open untapped markets would be to develop customized and bespoke artefacts that could raise the crafts' market values."

- 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, that we try to understand then we also saw certain existing researches, which talked about market interventions, where the different kinds of markets were targeted which had different scales of you know economy and different I mean users whose needs they were catering to.

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So, we tried to understand that, and we also saw this very interesting you know market value standards, how they could be based either on inhering traditional techniques and materials or completely on innovating the techniques materials and design.

So, we tried to understand that, then we also saw you know how important are market linkages, and starting from the craft cluster all the way till the dissemination and outreach and the sales. The market linkages and you financial support, they are very important.

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Open up to the world (Cosmopolitanism)	Technique innovation (Productivity)	Values creation & entrepreneurial skill (Economic viability)	Inheritance (Continuation)
Market Level			
<ul style="list-style-type: none"> Development of international and daily use market, 	<ul style="list-style-type: none"> Construction of websites and digital platforms for selling products and market analysis (WeChat, App, CZC) 	<ul style="list-style-type: none"> Exploration of untapped market for specific needs Branding & trademark High market value based on high quality hand skills and solutions to people's potential problems 	<ul style="list-style-type: none"> Preservation of historic marketplaces Development of customisation and bespoke objects Development of local market to meet local needs
Education Level			
<ul style="list-style-type: none"> Programme of student exchange with international universities Training course in design and marketing for local artisans 	<ul style="list-style-type: none"> Course construction of open source software Biotechnology course Emphasis on education for increasing students' ability in technical innovation across discipline, modern and traditional 	<ul style="list-style-type: none"> Improvement of students' proficiency both in craftsmanship and modern design Increasing students' understanding of region-related traditional culture 	<ul style="list-style-type: none"> Support of inheritors and craftspeople Development of apprenticeship within academic education

Craft and Sustainability: Potential for Interventions in Crafts in the Yangtze River Delta (YRD), China
 Potential Areas of 1) design intervention in YRD & 2) critical reflection implications for craft
 Source: 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), 52919-52934, DOI: 10.1080/14606925.2017.1352802

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And it is very important to understand the factors market that come into play, when the market linkages are identified and they are work closely with each other. We also saw some case study from china, where we are we trying to understand you know what are the interventions that actually happened at market level, and how china sees the craft sector in terms of the interventions.

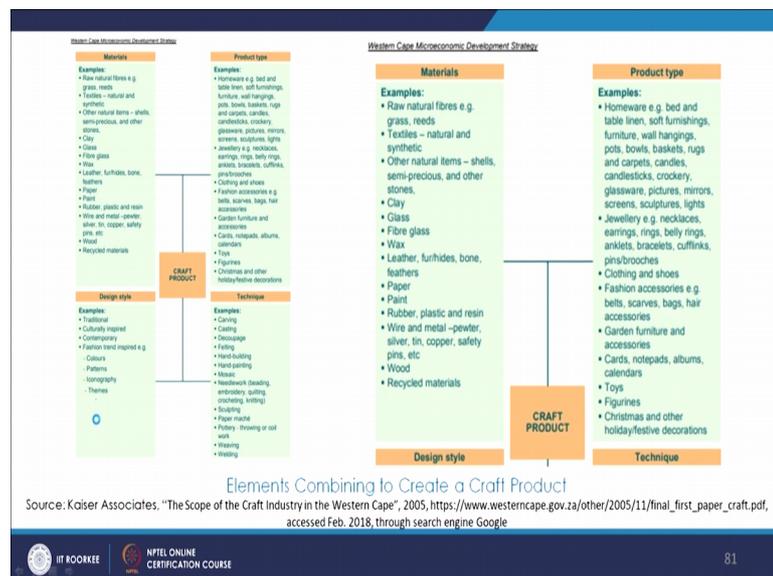
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Open up to the world (Cosmopolitanism)	Technique innovation (Productivity)	Values creation & entrepreneurial skill (Economic viability)	Inheritance (Continuation)
Promotion Level			
<ul style="list-style-type: none"> • International exhibitions and related art events • Interactive and digital museums • Knowledge exchange activities (forum, workshop and symposium) • International conference for craftspeople, artisans and artists 	<ul style="list-style-type: none"> • Interrelating individual artists, galleries, museums, and shops globally through construction of digital platforms, websites and Apps • A series of transformation of historical buildings or studios through modern design and technologies 	<ul style="list-style-type: none"> • Storytelling and narratives of heritage crafts • Excavation of related cultural context, landscape and architecture • Development of brochure with 'artisan workshops' map including artisans' stories 	<ul style="list-style-type: none"> • Visualization of craftsmanship, technique and process. • Making use of historical sites or buildings such as studios, museums and shops (e.g. Jingdezhen old kiln sites, residential houses of Wuzhen town)

Craft and Sustainability: Potential for Interventions in Crafts in the Yangtze River Delta (YRD), China
 Potential Areas of 1) design intervention in YRD & 2) critical reflection implications for craft
 Source: Xiaofang Zhan, Stuart Walker, Ricardo Hernandez-Pardo & Marilyn 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

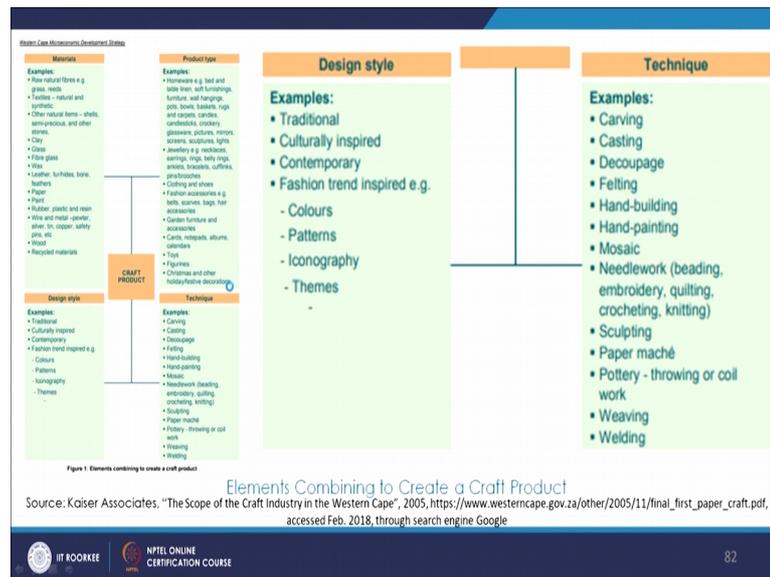
And further there were different levels at which the case study was discussed.

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So, we saw that so, we also tried to disappear a crafts product in terms of materials product type, design style and technique, which gives a fair understanding of different stakeholders, and also you know helps us understand the value chain and final linkages to the markets.

(Refer Slide Time: 20:30)



So, we tried to understand that different elements that composed the craft product.

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MARKET POSITIONING	CHARACTERISTICS
Predominantly functional items	<p>Quality: Medium to high</p> <p>Price point: Medium</p> <p>Types of retail outlets: Homeware shops, department stores, garden centres</p> <p>Scale of production: Relatively large scale order fulfilment expected</p> <p>Purchasing criteria: Primarily purchased for functional characteristics and coordination with other household items, pricing relative to mass produced items</p>
Fashion-led items	<p>Quality: Medium to high</p> <p>Price point: Medium to high</p> <p>Types of retail outlets: Clothing and accessory retailers, department stores, boutiques, fashion houses</p> <p>Scale of production: Relatively large scale order fulfilment expected in most cases (may also be examples of production of once-off items as samples or "signature pieces")</p> <p>Purchasing criteria: Alignment with fashion trends and brand identity, pricing relative to mass produced items</p>
Gifts and novelty items	<p>Quality: Low to high</p> <p>Price point: Low to high</p> <p>Types of retail outlets: Markets, specialist gift stores, museum shops, homeware and department stores</p> <p>Scale of production: Smaller batch through to medium size orders</p> <p>Purchasing criteria: Emotive purchase, "story" linked to the product, coordination with other items not essential</p>
Corporate gifts	<p>Quality: Medium to high</p> <p>Price point: Low to medium</p> <p>Types of retail outlets: Primarily direct or online sales to corporate purchasing managers</p> <p>Scale of production: Medium to large, generally requiring customisation</p> <p>Purchasing criteria: Price, lead time from order to delivery, reliability, "story" linked to the product</p>

Indicative market positioning options for craft products:
Western Cape Microeconomic Development Strategy

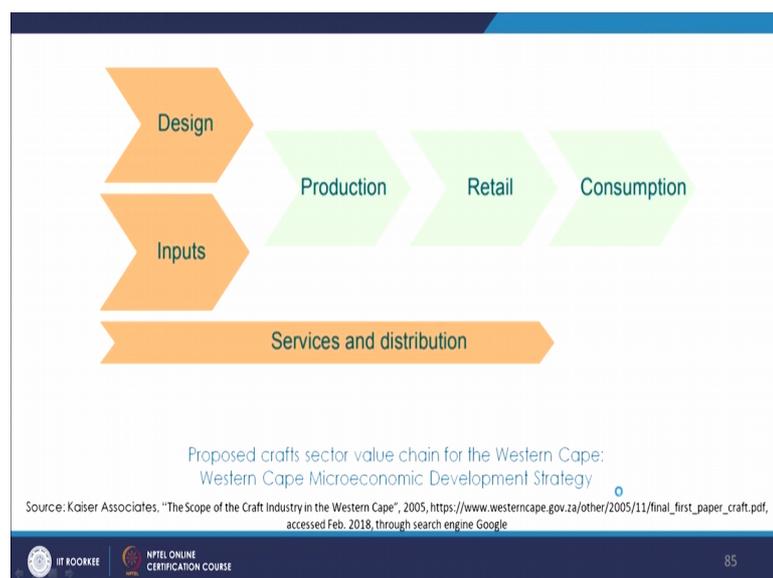
Source: Kaiser Associates, "The Scope of the Craft Industry in the Western Cape", 2005, https://www.westerncape.gov.za/other/2005/11/final_first_paper_craft.pdf, accessed Feb. 2018, through search engine Google

Then very interestingly, we saw the market positioning options for craft products, and how you know different categories of craft products are identified, and then there are different attributes which are given to them, and eventually if there is also the identification of you know which craft product or which range goes to which kind of market, and what is what kind of price it fetches, and what is the supply demand game over there depending on the end users and the buyers.

(Refer Slide Time: 21:17)

Collectibles/ Craft Art	<p>Quality: High Price point: Medium to high Types of retail outlets: Galleries, museum shops, producer outlet e.g. retail from studio Scale of production: Once-off or limited edition pieces Purchasing criteria: Uniqueness, creativity, familiarity with the artist, investment value</p>
Cultural artefacts	<p>Quality: Low to high Price point: Low to high Types of retail outlets: Markets, street traders, tourist outlets Scale of production: Small to medium-scale Purchasing criteria: Story behind the product, cultural affiliations (in cases where purchased by consumers with shared cultural heritage), perception of authenticity</p>
Souvenirs/ Curios	<p>Quality: Low to high Price point: Low to medium, some instances high Types of retail outlets: Markets, street traders, tourist outlets Scale of production: Small to medium-scale (mass produced curios may also be retailed through these outlets) Purchasing criteria: Association with travel experience</p>
Socially responsible / fair trade	<p>Quality: Medium Price point: Low to medium Types of retail outlets: Historically specialist fair trade outlets, increasingly also mainstream retail Scale of production: Small to medium scale Purchasing criteria: Social considerations are higher priority in purchasing decision than in other market segments, but price and style are still considerations</p>

(Refer Slide Time: 21:18)



So, that kind of interesting study we saw, and we tried to understand what is a value chain, and how is it important while we are talking about management and marketing.

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"The **factors that drive companies to go global** according to Dornier et al. are:

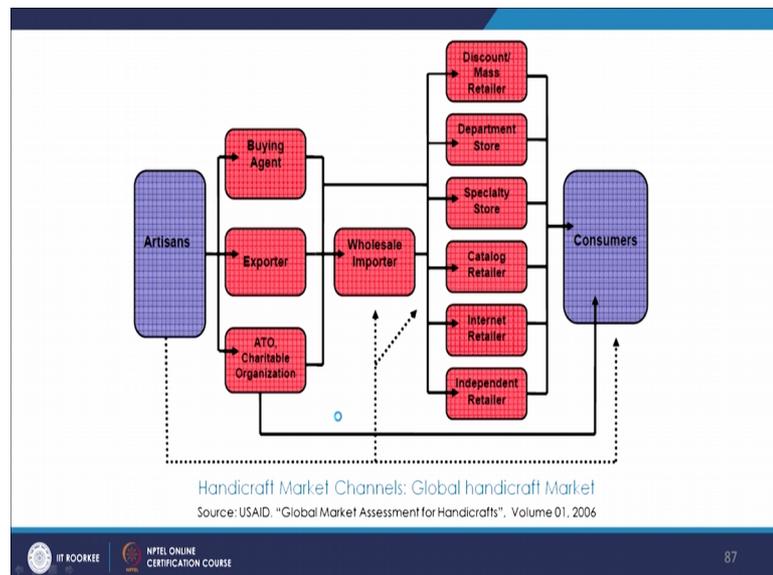
- Global **market forces**,
- Technological forces,
- Global cost forces,
- Political and economic forces. "

- Deepak Hajoary, "SUPPLY CHAIN MANAGEMENT OF INDIAN ENTERPRISE IN INTERNATIONAL OPERATIONS: TYPE OF MODERN LITERARY CRITIQUE" International Journal of Research – Granthaalayah, Vol. 4, No. 3 (2016): 107-118

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And then we saw you know factors that drive, the companies to go global and how market forces play a very important role in that reinforcing, the study you know, why we took up this module and why general we were talking about interventions after all and all this modules.

(Refer Slide Time: 21:41)



We also discussed a little bit about the market channels, and what an important role they play again, when we are talking about the market and management in the craft sector.

(Refer Slide Time: 21:55)

Harrison and van Hoeck, 2008, p. 6	"Supply chain management: Planning and controlling all of the business processes - from end-customer to raw material suppliers - that link together partners in a supply chain in order to serve the needs of the end-customer."
Lummus and Vokurka, 1999, p. 17	"All the activities involved in delivering a product from raw material through to the customer including sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, delivery to the customer and the information systems necessary to monitor all of these activities of these activities into a seamless process. It links all of the partners in the chain including departments within an organization and the external partners including
McLaren <i>et al</i>	"involves the coordination of an organization's internal planning, manufacturing, and procurement efforts with those of its external partners".
Simchi-Levi <i>et al.</i> (2008)	"Supply chain management is a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requirements"

Definition of Supply Chain Management

Source:
Deepak Hajoary, "SUPPLY CHAIN MANAGEMENT OF INDIAN ENTERPRISE IN INTERNATIONAL OPERATIONS: TYPE OF MODERN LITERARY CRITIQUE"
International Journal of Research - Granthaalayah, Vol. 4, No. 3 (2016): 107-118

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Ah moving on we try to understand what is the supply chain management.

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DOMESTIC SUPPLY CHAIN	GLOBAL SUPPLY CHAIN
Supplies within the country	International supply chain
Less supply chain risk	Very high rate of supply chain risk
Less supply chain security issues	High risk security issues
Less issues on payment terms	Issues regarding payment of international suppliers and vendors
Regulatory issues can be less as it operates within the country	Regulatory issues are very complex
Supplier selection is easy process	Supplier selection is difficult
Mode of payment is easy	Mode of payment involves currency fluctuation and involves complex problem.

Domestic and Global Supply Chain

Source:
Deepak Hajoary, "SUPPLY CHAIN MANAGEMENT OF INDIAN ENTERPRISE IN INTERNATIONAL OPERATIONS: TYPE OF MODERN LITERARY CRITIQUE"
International Journal of Research - Granthaalayah, Vol. 4, No. 3 (2016): 107-118

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What are the different stages? What are the different role players within that why is that important? How does a global supply chain come into picture? And what is it when we talk about the domestic supply chain. And how do they differ and how do they really impact the market forces, and the different stakeholders involved.

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Sl.	Supply chain Drivers	Functions
1	Facilities	Facilitates inventory supply from its location
2	Inventory	To meet demand and supply in the supply chain
3	Transportation	Reduces efficiency, faster delivery of items
4	Information	Facilitates transparency and communication among drivers in the supply chain
5	Sourcing	Decides when to source.
6	Pricing	Firm build its competitive strategy

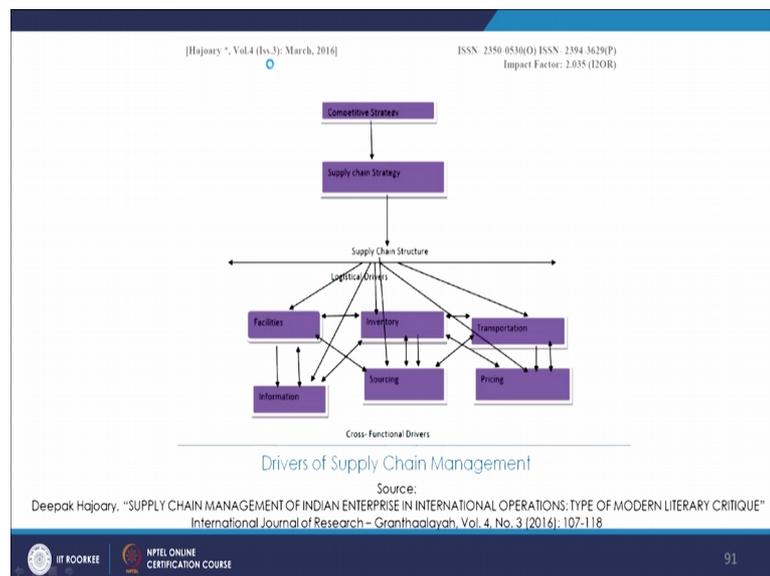
Drivers of Supply Chain Management

Source:
Deepak Hajoary, "SUPPLY CHAIN MANAGEMENT OF INDIAN ENTERPRISE IN INTERNATIONAL OPERATIONS: TYPE OF MODERN LITERARY CRITIQUE"
International Journal of Research – Granthaalayah, Vol. 4, No. 3 (2016): 107-118

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We also tried to understand the supply chain drivers and what are their functions.

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And we tried to see this diagrammatically the supply chain management how it happens.

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Taxation	Policies of less tax in certain location of setting manufacturing plant Special economic zone offer tax benefits for companies
Logistics infrastructure	Poor infrastructure of sustaining supply chain by Indian companies
Global connectivity	Need to increase connectivity of its chain at international platform
Demanding customers	Numerous types of customers
Supply and demand	Unable to meet supply and demand of Indian market
Security of supply chain	Risk in security of supply chain
Bandh culture	Affects supply chain to deliver within lead time provided
Supply chain risk	Unavoidable supply chain risk in India. Risk of anti social activities of doing business
Supplier risk	Very difficult to find type of supplier with good track record.
Transportation	Infrastructure problem in current Indian scenario. Unable to transport in some regions of India

Issues of Supply Chain Management in India

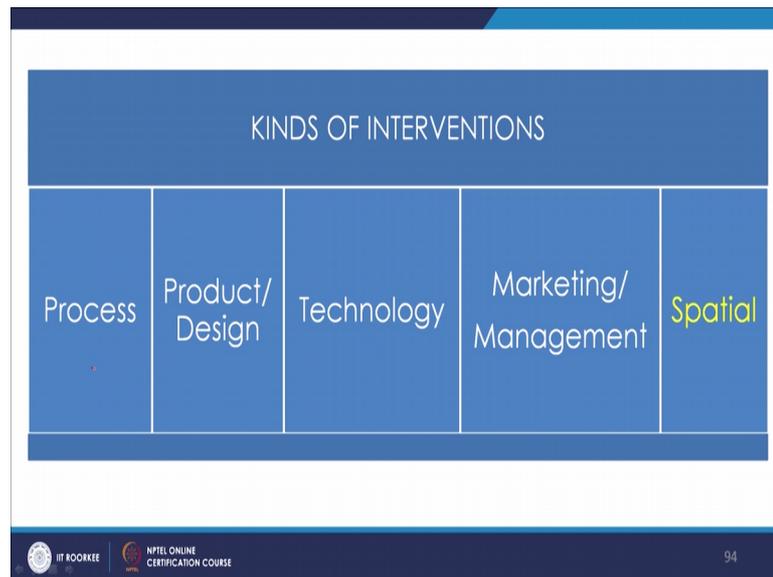
Source:
Deepak Hajoary, "SUPPLY CHAIN MANAGEMENT OF INDIAN ENTERPRISE IN INTERNATIONAL OPERATIONS: TYPE OF MODERN LITERARY CRITIQUE"
International Journal of Research – Granthaalayah, Vol. 4, No. 3 (2016): 107-118

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And we also very briefly discuss the supply chain management issues in India, and what are the different problems and challenges that one faces, and that it is important to take care of them and work towards them, so, that you know. These issues are resolved and the, this gap between supply and demand reduced and finally, the outreach to market improves reliability of craft products improves the bottle next are reduced, so, we had that kind of discussion.

So, this was our overall summary of what we discussed within this module of interventions. So now, having discussed all the 4 different kind of interventions, that we saw during the last 4 modules. We will now see the interventions that has spatial, and which invoice the interrelationship between craft and interior architecture.

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So, we discussed these 4 types, and this one I have added here which talks about the spatial interventions.

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The slide has a white background with a dark blue header and footer. The header contains the title 'Gottfried Semper - Leading Architectural Theorist of Nineteenth Century' in blue. Below the title is a bulleted list of six points. The first point is underlined. The footer contains logos for IIT ROORKEE and NPTEL ONLINE CERTIFICATION COURSE, and the number '95' on the right.

Gottfried Semper - Leading Architectural Theorist of Nineteenth Century

- The Four Elements of Architecture (Published in 1851): Earth for the foundation, Wood for construction, Textile for enclosure and Fire for climate.
- Stresses the importance of review in all styles and periods of architecture polychrome
- Believed **paint was used on classical buildings as a protective material** (Greek, Etruscan, Egyptian)
- There is proof that paint still exists on these buildings
- **Statues from all cultures were polychromatic instead of their current monochrome appearance**
- **Color had symbolic associations**
- **Color is an expression of artistic freedom**

So, like I told in beginning that particularly we are going to discuss about Gottfried semper. He was an leading architectural theorist of 19th century, and he is very famous for his work the 4 element of architecture; where you know, he considered earth for the foundation associated wood for construction, textile for enclosure and fire for climate.

So, when we talk about spatial intervention the most important for us is to understand how we saw textiles being used for creating enclosure and space making.

He also talked about the importance of color, and he also emphasized on the tectonic arts. So, he believed paint works used on a classical building as a protective material. So, it was not just aesthetical, but semper believed that it was a protective material. And that is also what we see in lot of ancient techniques of mural and painting, where the coat or the layer is described as protective which prevents the underneath layer from you know weathering insects and lot of other different issues.

So, that is what in the semper emphasized upon. Also statues from all cultures were polychromatic, instead of their current monochrome appearance; this is also highlighted in the works. Color had symbolic associations, and color played a very profound role within the interior architecture and also it is an expression of artistic freedom.

(Refer Slide Time: 25:36)

Material	Clay	Wood	Textile	Stone
Technique	Ceramics	Carpentry	Weaving	Masonry
Space-Making Elements	Hearth	Roof	Enclosure	Substructure

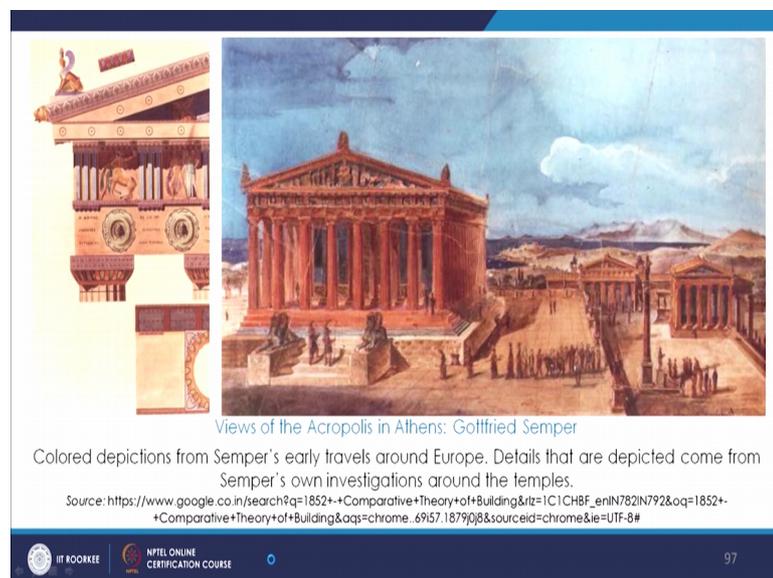
Source: https://www.google.co.in/search?q=1852+-+Comparative+Theory+of+Building&rlz=1C1CHBF_enIN782IN792&oq=1852+-+Comparative+Theory+of+Building&aqs=chrome..69j57j1879j0j8&sourceid=chrome&ie=UTF-8#

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So, we see here an inventory which talks about the material the technique associated with it, like the technique of making and the space making elements, which could be associated to that particular material with the technique of making. So, clay the technique that is associated with clay ceramics, and the place making element is earth. And when we talk about wood basically carpentry and for the construction of roof as a space making element within the gamut of space making principles.

Textile technique is weaving and it generates a enclosure, and enclosure could be understood in terms of the space making element that is wall. And stone for masonry and of course, we associated with the construction of substructure. So, that is the kind of inventory that talks about the material, the technique, the space making element, something that we have been discussing throughout this course, you know, how to identify certain materials the technique of making that goes with it and the space making element that it contributes in the making of and that is how we see the interrelationship between material building craft interior architecture space making.

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So, these are some color depictions from sempers early travels, and there are investigations, which talk about you know the observations related to color making details, tectonics, ornamentation, so, we see some pictures over here.

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1852 - Science, Industry, and Art (Proposals for the Development of a National Taste in Art at the closing of the London Industrial Exhibition)

- Talks about the **necessity of inventions and the advancement of arts and sciences**

1852 - Comparative Theory of Building

- Reviews all building types, their locations, **methods of building, making and histories**

1859 - Style in the Technical and Tectonic Arts or Practical Aesthetics

- Discusses extensively the **use of materials within arts, crafts, and architecture**
- Reviews the **details involved in the tectonic arts**
- Analyses **architectonics in antiquity and current architecture**
- Provides mathematical formulae to categorize different styles

Publications: Gottfried Semper

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Of course there are also many other works which are very significant when we talk about semper. And then we see this focus on science industry and art and amalgamation and the necessity of inventions and the advancement of arts and sciences. So, you know how there is a profound role of art craft, then we also talk about sciences. Then there is this comparative theory of building, which emphasizes on methods of buildings and making. And then of course, the very famous style, the style, tectonic arts and the practical aesthetics, which is more relevant when we talk about today's section on spatial interventions.

So, here this work in 1859 it focuses on use of materials within arts crafts and architecture, and then details involved in the tectonic arts, architectonics. Some term that emerged out of this kind of work and theory and the kind of applications that semper exemplified. So, architectonics in antiquity as well as in the current architecture so, also categorization of different styles, all of these are very significant works.

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The fusion of textiles and architecture, including the processes, techniques and materials involved, has a long and winding, but largely neglected history. Only **in recent times** have **theorists, architects, engineers, textile designers, material scientists and artists expressed a renewed interest in the possibilities that the combination allows.**

The German architect and theorist, Gottfried Semper wrote extensively on the significance of art and architecture. **The origins of architecture, according to Semper, did not originate from the primitive hut but from the arts: the first structure, the original "abode of man" required not just structure, but the weave, the knot, the textile and the tangible.**

Architecture and Textiles
How will the use of textile methods and materials influence form, structure and skin?

Source: Wigglesworth, R. "Architecture and textiles", 2010

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Then a when we talk about architecture in textiles, we see that in recent times, theorist architect's engineers, textile designers, material scientists, artist, they have all expressed a renewed interest in the possibilities that the combination allows. Also the origins of architecture according to the semper, did not originate from the primitive hut, but from the arts. The first structure the original abode of man required not just structure, but the weave the knot the textile and the tangible. So, that is why the weave and the knot come into picture, and semper tried to study the structure within them and tried to understand how they could also contribute in space making and how architecture is incomplete without the integration of textiles and without this sense of enclosure.

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"Textiles provide protection from heat and cold, absorb noise, and give control of the amount of light entering the view. Their manifold characteristics and Application potentials make textiles a highly interesting architectural material. Textiles further possess very special, sensually tangible often poetic aesthetics."

Architecture and Textiles

How will the use of textile methods and materials influence form, structure and skin?

Source: Wigglesworth, R. "Architecture and textiles", 2010

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Also textiles provide the protection from heat and cold absorb noise, and give the control of amount of light entering the view. Textiles further possess very special sensually tangible often poetic aesthetics.

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Being simultaneously a functional technique and a symbolic means of representation, the knot was a mediating figure between the ritual act, the technique of making, and the actual work of art or craft. In time, the motif of the knot was developed further in the more complex techniques of the braid, the wreath, the seam, and the weave, all constituting primordial symbols of ordering.

Architecture and Textiles: Exploring **the Knot**

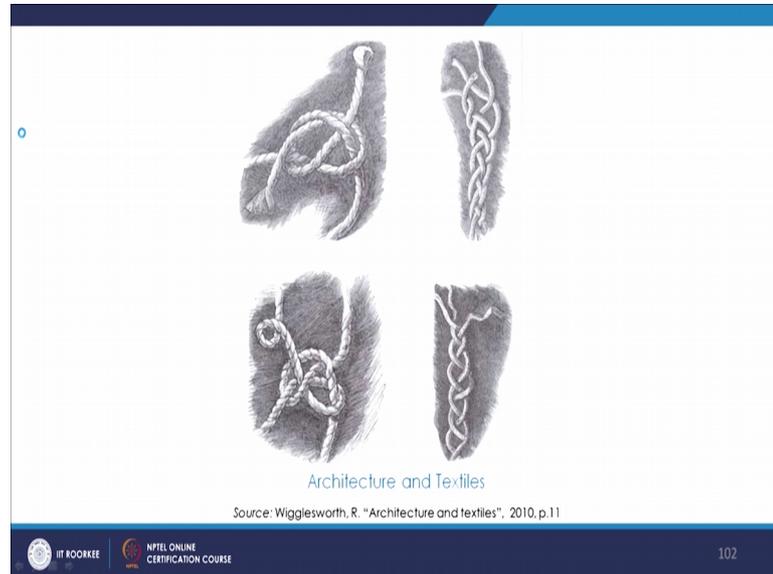
Source: Mari Hvattum, Gottfried Semper and the problem of Historicism, [U.K:Cambridge University Press, 2004], pp 67-68

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Then being simultaneously a functional technique and a symbolic means of representation, the knot, it was a mediating figure between the ritual act the technique of making, and the actual work of art or craft. So, we are talking about exploring the knot here, that we see within textiles and how it has a very significant role in the work of art

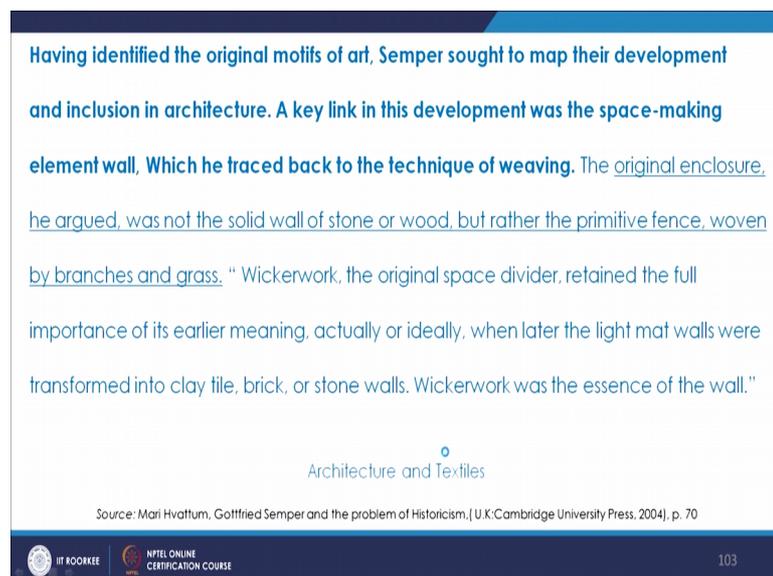
craft and also architecture, because basically the focus of technique of making and the structural nuances of knot.

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So, here we see certain drawing where you know the knot and the structure within the weave it has been explored.

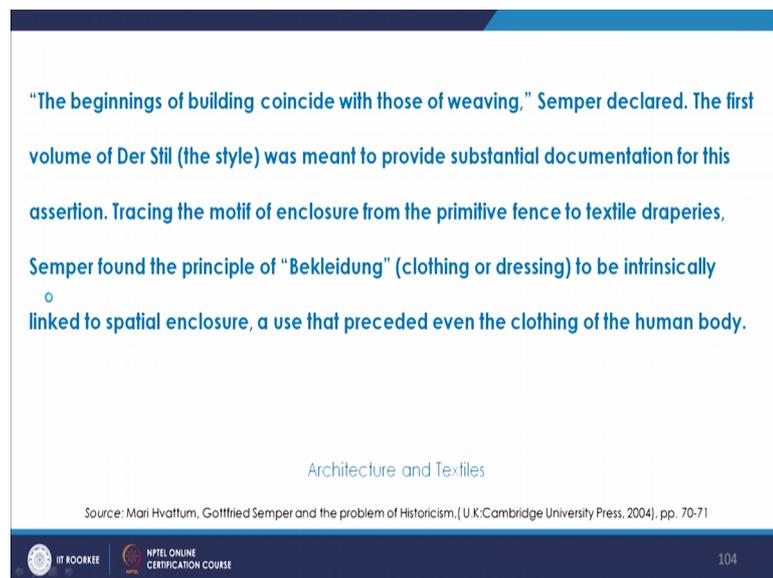
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Having identified the original motives of art, semper sort to map their development and inclusion in architecture, A key link in this development was the space making element wall; which he traced back to the technique of wave weaving. So, technique of weaving

the role of knot, and then trying to explode the structure within the technique of weave making, to create an enclosure and a space making element like wall. The original enclosure he argued was not the solid wall of stone or wood, but rather the primitive fence woven by branches and grass.

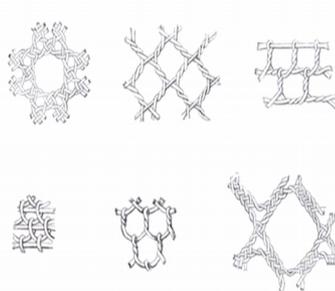
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So, again the very important role of weaving as a technique which contributed in space making; the beginnings of building coincide with those of weaving semper declared. The first volume of the style was meant to provide substantial documentation for this assertion. Tracing the motif of enclosure from the primitive fence to textile draperies semper found the principle of clothing or dressing, to be intrinsically linked to spatial enclosure.

A use that preceded even the clothing of the human body so, that is what we are also discussed in previous few modules when we are talking about architectural clothing or skin, that is the concept of clothing or dressing that was given by semper and it is linked to spatial enclosure and he has done enormous work in asserting this kind of linkages.

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Architecture and Textiles

In his drawings above of crochet and knitting, Semper clearly illustrates the potential for structural arrangements and space-defining qualities that textile crafts possess. Textile art according to Semper, had a significant influence on the development of architecture.

Source: Wigglesworth, R. "Architecture and textiles", 2010, p.12

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Some more drawing and pictures and here, the techniques of crochet and knitting are also highlighted. And it illustrates the potential for structural arrangements and space defining qualities that textile crafts possess.

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Architecture and Textiles

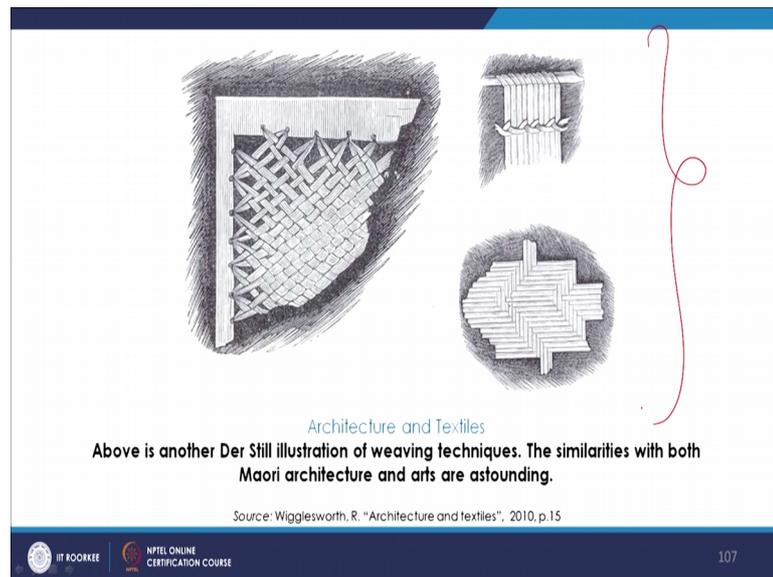
Simple textile techniques of the weave, and the knot constitute the joining techniques of structural elements in early Maori architecture. These techniques stood in complete contrast to the building techniques of early European explorers.

Source: Wigglesworth, R. "Architecture and textiles", 2010, p.12

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Some more examples from Maori architecture; the community that builds for their own living, and simple textile techniques of weave and the knot. They constitute the joining techniques of structural elements, so, we will see that in this architecture.

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Over here, again some more illustrations we see over here weaving structural implications.

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These are some contemporary examples of this is the cultural complex, and we see this spectacular glimmering facade; which is a eulogy to semper clothing or dressing. So, expressions could be different for contemporary times, and there are lot of projects I have put very briefly.

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Architecture and Textiles

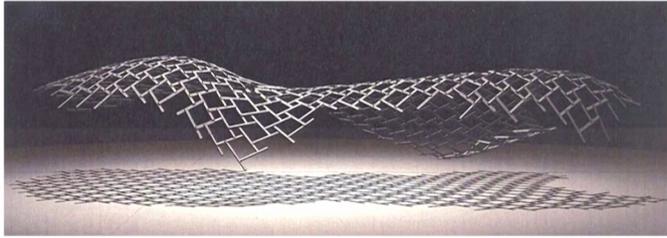
Another architect that has advanced the research into contemporary applications of architecture and textiles is Paris based architect, **Dominique Perrault**. Perrault is famous for his explicit and extensive textile-based architectural urban designs. For more than 16 years he has been researching the relationship between textiles and architecture as part of his broader project on the contemporary city.

Source: Wigglesworth, R. "Architecture and textiles", 2010, p.20

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Another architect who also significantly tries to explore the applications of architecture and textiles, it is a Dominique a Paris based architect and we see some of the works over here.

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Architecture and Textiles: **Timber Fabric, Shigeru Ban**

Contemporary architextile techniques make use of woven or knotted structures. Research into such structures has been lead by the **Advanced Geometry Unit (AGU) at Arup**, founded by Cecil Balmond and Charles Walker. The AGU's work is characterized by a highly mathematical, topological approach, as is evidenced by their research into **knot diagrams**. AGU has also studied **the topology of the weave and its application to large scale structural systems**. This technique called, macroweaving is the discrete bending or compression of shell elements, rather than the microweaving of fabrics to form tension only surfaces.

Source: Shigeru Ban and Arup AGU, Forest Park Pavilion, St Louis, Missouri, 2005; Tristan Simmonds, Martin Self and Daniel Bosia, "Woven Surface and Form," Architectural Design Architextiles vol 76 (2006), p. 87

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So, he is very famous for the extensive textile based architectural urban designs. Then we see this timber fabric. So, Shigeru ban and Arup, they have explore it together. So, the oven knotted structure which are researches, and then their the application is done in huge architectural projects to explore the a large scale structural systems.

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Architecture and Textiles

Testa and Weiser's 2004 Carbon tower design constitutes one of the most ambitious examples of a contemporary fusing of textiles and architecture. The structure is woven together, rather than assembled from a series of distinct parts, as in traditional construction methods, and has a double façade of transparent and translucent membranes. This project, has solved major problems in the use of textiles in architecture and has made 'weaving a building' a potential reality.

Source: Matilda McQuaid, "Tectonics and Textiles". *Architectural Design Architectures* vol 76(2006): p101

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This is another very interesting example carbon tower design, and here also we see the use of membrane, and you know the textile architecture. So, that is again like you know weaving a building.

And this is just a potential reality as I simplified by this project. In fact, there are more examples due to the shortage of time I have not put it, but during the discussions forums we can talk about them, and there are cases from India also, we see the application at the surfaces as well as structural, you know, levels where the Ikkath arts is seen in the interiors the fabrics the upholstery and also now on the facade of the building, and lot of the different examples, few we have already seen in the previous modules.

So, that is a significant section and I just wanted to discuss a few examples focusing on these spatial interventions. Now since I said this is the last module, I really hope that the course was very useful and informative. And there are lot of references and you to go through them in detail and you know come up with different kinds of exercises, and understand the subject better, it would be completely open and one would express some initiatives. So, let us see some references.

(Refer Slide Time: 36:13)

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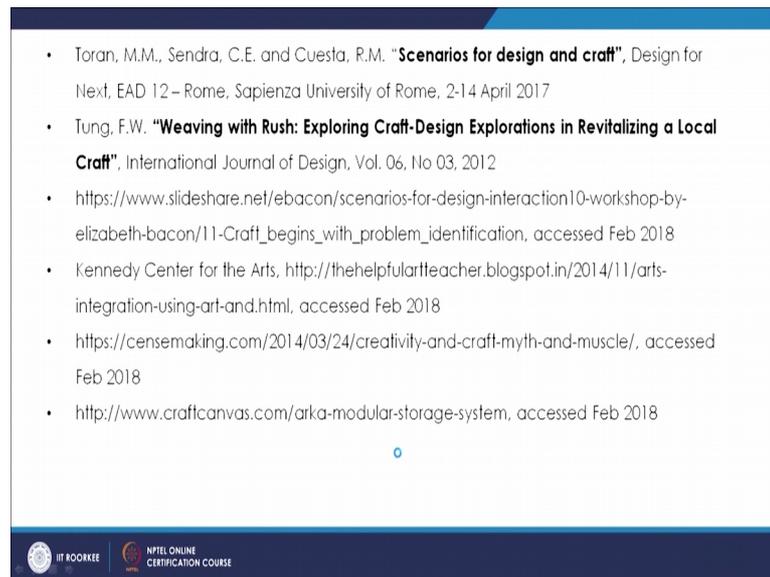
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So, some particular case studies that we discussed during the intervention part they are mentioned over here.

(Refer Slide Time: 36:26)



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And we have been talking about scenarios of design and craft, we have been talking about craft design explorations.

(Refer Slide Time: 36:36)



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And in general, we have been talking about interventions as a form of enquiry. We saw this case study of Kala Raksha Vidyalaya, we saw some more references on intervention part.

(Refer Slide Time: 36:51)

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And of course, there is a consolidated list of references that we have been referring to, and we were talking about some case studies about Thikri Kaam within the summary module also.

(Refer Slide Time: 37:05)

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So, all of these references are put over here.

(Refer Slide Time: 37:08)

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Thank you.