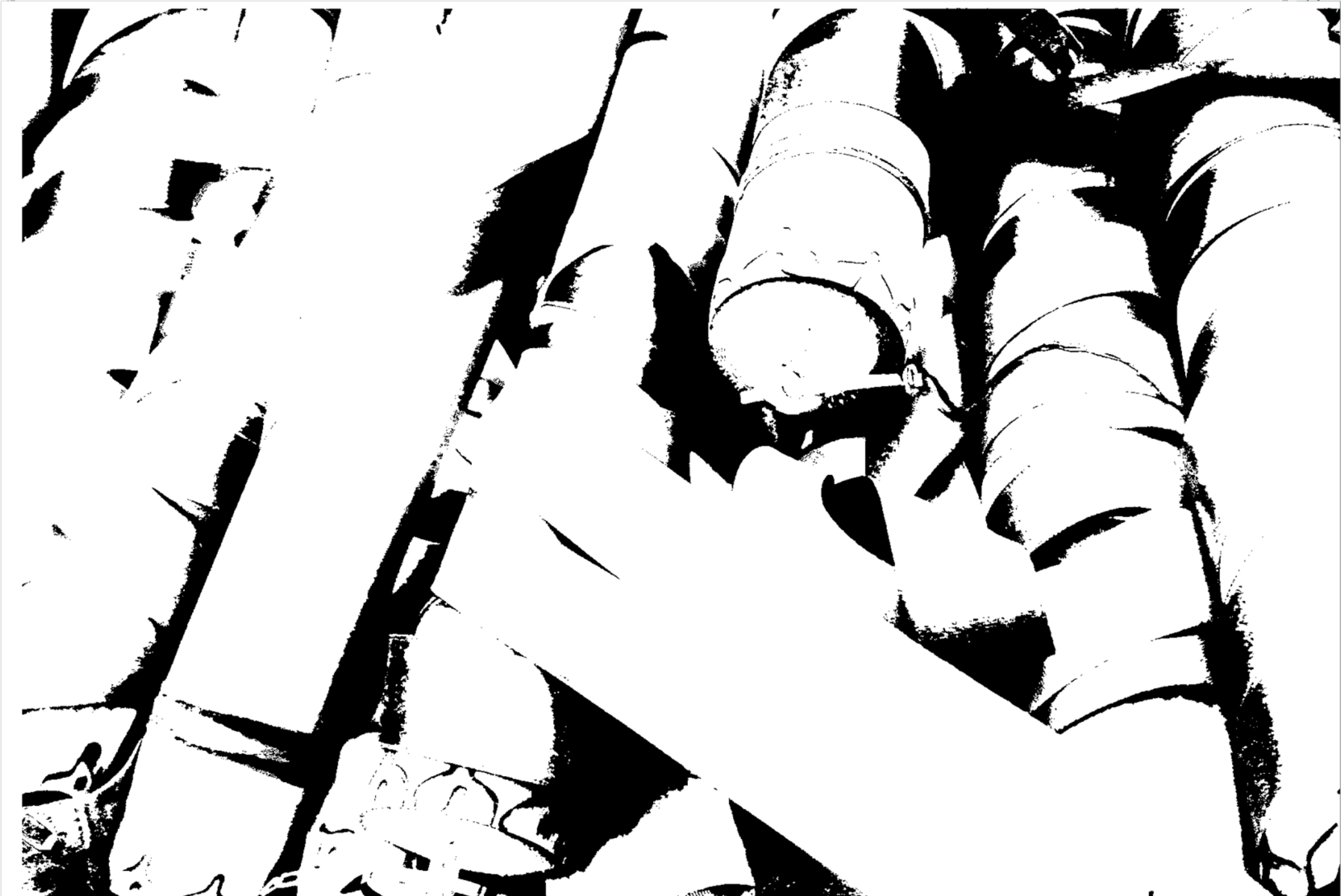






SUMMER INTERNSHIP PROJECT

**COMPANY : HONEYWELL TECHNOLOGY SOLUTIONS LAB PVT. LTD.
BANGALORE**

**PROJECT TITLE : Enhancing slum businesses by design
intervention**

Duration : 13th May to 13th July

**Guides : Prof. B.K.Chakravarthy(IDC,IITB)
Prof.Linda Pulik (ID,IITC)**



CONTENTS

- Acknowledgement
- Company overview
- Project aim and introduction
- Research area and approach
- Need for documentation and testing
- Project Documentation
- Process and experiences during prototyping
- Process involved in prototype testing
- On site prototype testing
- Results and analysis of testing
- Documentation of experiences
- Special strategies evolved
- Design refinements
- Bibliography
- Contacts

ACKNOWLEDGEMENT

I thank Honeywell for giving me this opportunity to experience a very different and an important aspect of design process.

I would like to convey my regards to Prof.B.K.Chakravarthy whose inspiring comments has always helped me to move on the right track.

I am gratified to Prof. Linda Pulik(Adjunct faculty,ID,IIT Chicago) whose innovative suggestions and on time reminders and contacts helped me to carry out my work more efficiently.

I'll also thank Mr. Mathew Gilbert and Jennifer(Program manager at the city of Chicago) for their special navigation at an unknown set up.

I also wish to thank all those who helped me during my project directly or indirectly.



COMPANY'S OVERVIEW

Honeywell International is a diversified technology and manufacturing leader, serving customers worldwide with aerospace products and services; control technologies for buildings, homes and industry; automotive products; turbochargers; and specialty materials. Honeywell is a major American multinational conglomerate company that produces a variety of consumer products, engineering services, and aerospace systems for a wide variety of customers, from private consumers to major corporations.

Honeywell is a great place to work. They offer challenging assignments and the opportunity to work with some terrific people around the world. They emphasize continuous learning, with opportunities to improve and grow our skills and experiences. They hire the best people; give them every possible opportunity to learn, grow, and develop.

Honeywell Technology Solutions (HTSL) is an integral research, development and engineering arm providing value to Honeywell's businesses and customers through technology, product and business solutions, meeting global standards of quality, innovation and lifetime performance. Employing diverse engineering skills, coupled with program management, quality assurance, systems engineering, technology and market analytics, HTSL provides total solutions to Honeywell businesses in the areas of Aerospace, Automation and Control Solutions, Specialty Materials and Transportation Systems. One of the larger R&D outfits established by multinational corporations in India, HTSL has been rated as one of the 15 best places to work for in India by the Business Today in 2007.

The Honeywell logo is displayed in a bold, red, sans-serif font. It is positioned between two horizontal green lines that extend across the width of the slide. To the right of the logo, there is a solid green circle.

PROJECT AIM AND INTRODUCTION:

“ENHANCING SLUM BUSINESS BY DESIGN INTERVENTION”

The proliferation and widespread use of networks for social, professional and business development have established social networking as an important business development strategy. This is an academic course which focus on applying similar strategies to an economic development problem. Students conceive and prototype design solutions based on an understanding of existing social networks in small business communities in two neighborhoods of Little Village in Chicago and Powai slums in Mumbai.

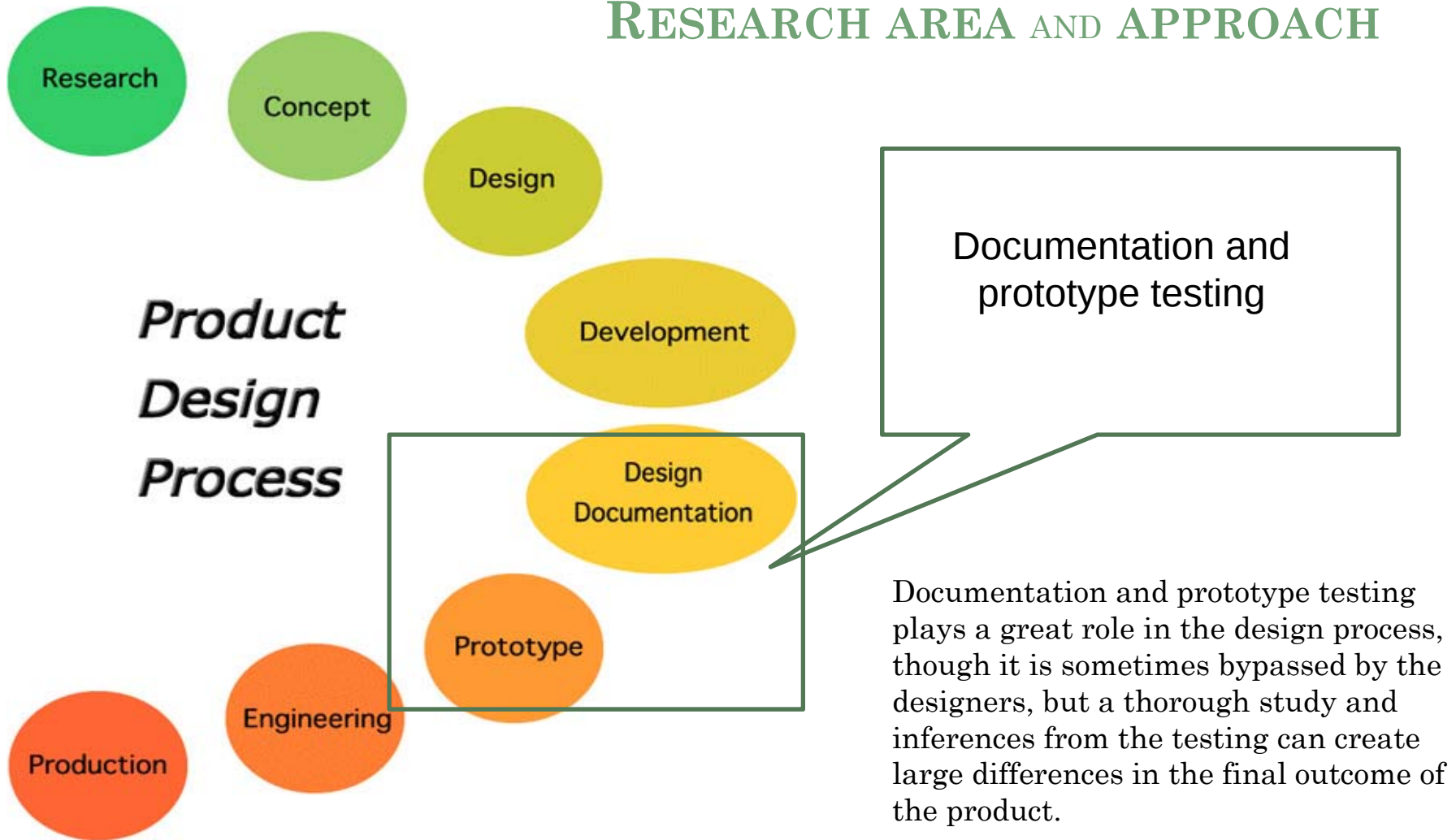
This course also provides the base for the “Long Distant Design Strategy” and the new experiences involved.

The course enabled to learn the following :

- Gain experience in applying design and business practices to economic development issues.
- Learn remote design and research techniques by way of an exchange with graduate students at the Industrial Design Centre, IIT Mumbai.
- Applying design skills and methods to develop products, communication or service designs that contribute to increasing prosperity and small business growth within Chicago and Mumbai neighborhoods.
- The whole course is divided mainly into 3 stages:
 - Stage I : Research and concept development
 - Stage II : Mock up Model testing and design refinement
 - Stage III : Prototype testing and design refinement



RESEARCH AREA AND APPROACH



NEED FOR DOCUMENTATION AND TESTING

Some projects can produce a tremendous volume of data in the form of notes, survey booklets, sketches, photographs, videos and drawings. The volume can be overwhelming. A lot of carefully collected data is small, easy to lose and to some extent fragile, it makes a good sense to develop a simple system of compilation for producing an overview of overall process and learning experience.

- Documentation and compilation do the work of joining the phrases that completes a full story.
- It gives a base for future references.
- Capturing a subject saves the data which sometimes is bypassed by the designers.
- It gives an overview of the design process involved and some new strategies followed.

Now, having reached the point at which an embodiment solution has been found, it is now time to check that this embodiment is fit for its intended purpose. This involves prototyping and testing of new products.

Prototypes fulfill several functions in product development. They can act as communication media for discussions with client. It adds more value to the design of the emerging new product.

From this prototype testing,

Reformations can be done to make the product more suitable in its respective contextual situation.

And also in Making the knowledge useful for future Studies



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DOCUMENTING THE PROJECT:

**ENHANCING SLUM BUSINESS BY
DESIGN INTERVENTION**

A short review :

4 teams with student's from varied academic background from each institute

exchanging data



YOUNG DESIGNERS AT IIT BOMBAY

YOUNG DESIGNERS AT IIT CHICAGO

Team 1



Ameya Surve, Abneet Chauhan,
Divya Saxena, Prajwal

Team 2



Darshan Nerker, Sarang
Kusale, karthik Narayan

Team 1



Gauri, Edwin, Marie Claude,
Valerie and Vishvesh

Team 2



Rima, Bhumi,
Soham, Anshul

Team 3



Abhishek Prasad, Prajakta
Bamanikar, Amey Naik

Team 4



Yohan Engineer, Amey Dhuri,
Nagsen, Dipesh Parmar

Team 3

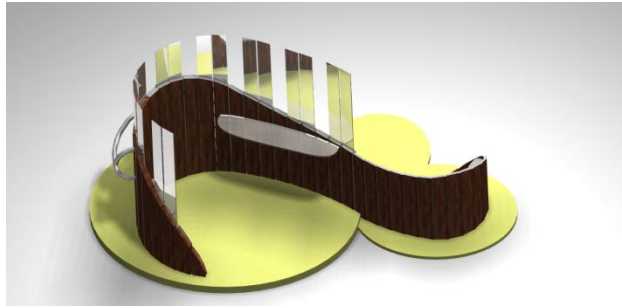


Shilpa Rao, Dan,
Vasila, Amy, Kyungsun

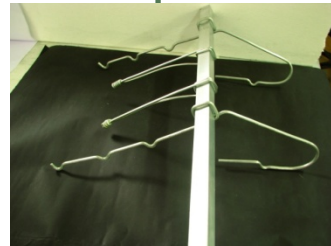
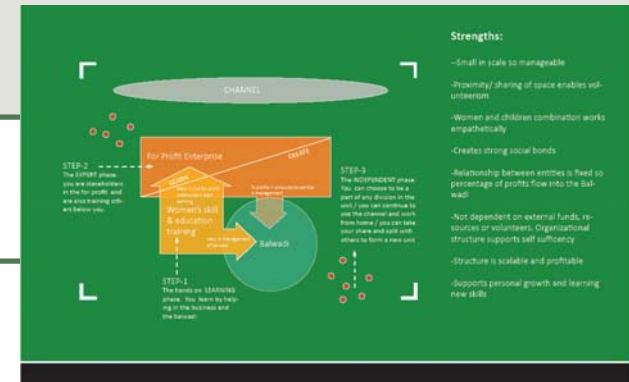
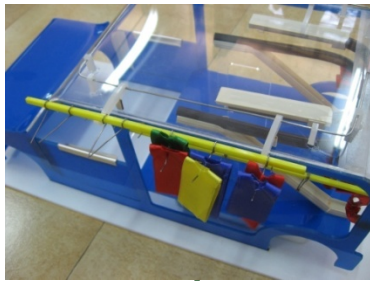
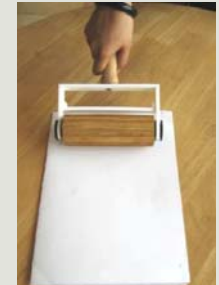
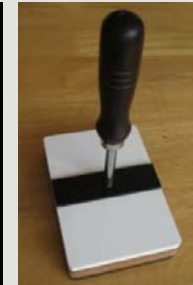
Team 4



Nal Hwl, Antonil,
Swapnil, Preethi



Various levels of design solutions were evolved for various businesses.



Design process involved intense study of the subjects and sites contextually. Lot of data was shared among the students and while during the journey students experienced some very unique design approaches.

PROCESS AND EXPERIENCES DURING PROTOTYPING

During prototyping the product to full scale, a lot of constrains and new changes were done. The following challenges were faced during the prototyping so to form and fit the component parts according to the design evolved:

- ❑ How some design details can be changed to make the full scale product suitable for transporting and assembling for long distant sites without changing their purpose.
- ❑ How the fixing details can facilitate minimum drilling so as to make it suitable and allowable to fix on site.
- ❑ Choice of appropriate materials according to the design evolved.
- ❑ Searching for alternate and simpler methods for prototyping without changing the essence of design evolved.

Prototypes of following products were completed for particular business setups at appropriate scales for the testing:

The Craft Shop : "Oxalla De Botanica"

Scale of model : 1:1



Since the owner is a craftsman , he is not able to give full attention to his customers neither to his craftwork.

Present scenario

- *Entrance is quite dark ...
- *They use small lighting fixtures even in day time...
- *Nothing is emphasized as such....
- *Similar to every store at the neighbors.
- *The whole street is having the combination of dull colors (shades of grey and blue)
- *Interaction of the entrance with the passerby's is nil.
- *Shop demands more emphasized entrance

Virtual Attender : Bamboo and the Ribbon curtain

Functions:



- * Attention seeker.
- *Experience provider.
- *Provide a background for an identity of a mexican craft shop.
- *Gives an opportunity to display.
- *A new identity to the shop.
- *The passerby's or the customers get a feeling of Mexican atmosphere by user experiences. i.e. Visually , sensory and even auditory.

The Craft Shop : "Oxalla De Botanica"

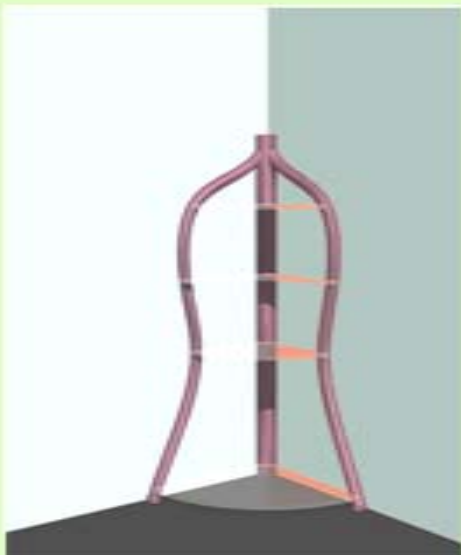
Scale of models : 1:5

Painting aisle and hanging display made of cane



- *customer's involvement
- *to create a virtual attender in craft shop which can create interest to art lovers.
- *To enhance the art and culture.
- *Customers should experience a craft Rich place while they roam around the painting .
- *Atmosphere should give the feeling of Mexican culture.
- *Create a side bussiness.
- *Gives an opportunity to learn mexican art.

Side display unit



- *Artifacts and paintings get a dedicated space thus enhancing their value
- *The other commodities too get a equally valued space
- *Elevated platform provides sense of space thus enhancing experience along with the visual elements.
- *Extensive use of wood in the structure enhances handicrafts and hence maintaining the essence of Mexican culture and art shop
- *Modularity providing flexibility to the structure and hence to the layout of the shop
- *Usage of reflective material provides enhanced view of the shop from any position

Bakery bussiness

Scale of models : 1:1

Aim :

To design a product to reduce the time involved in cutting and processing before feeding to oven

*To introduce newer varieties

*To have better consumer interaction and consumer involvement

*Reducing time involved in pre-baking processing



Pattern maker



Multiple rollers with variety of patterns

Customer chooses pattern on biscuits of his own choice

Jam biscuits



Less preparation time

Better biscuit quality

Accurate shapes possible

Variety in shapes of biscuits with jam core

Consumer personalization

Stensils for topping



Multiple designs for customer to choose from

Customer involvement in making the cake

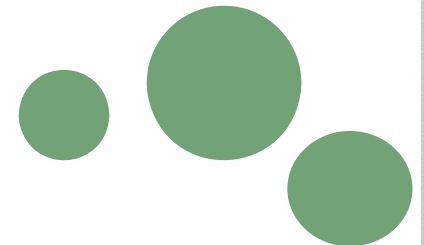
Customer satisfaction

PROCESS INVOLVED IN PROTOTYPE TESTING

The sole aim of prototype testing revolves around our assumption of successful long distant design. It is to test whether our sharing and learning from the data was successfully conveyed within designers or not.

Points which were remembered before testing:

- Is the concept understood and are underlying principles appreciated?
- Is the novelty of proposed concept valued?
- How does it compare with the underlying principles of existing products?
- Form and fit of component part to the site,
- Can the product be made and assembled to specification?
- Whether the contextual designs understood and made will work under their respective environment.
- Do people expect this change in their old traditional setup.
- What are the different reactions of people?
- Insights into how time of day and age affects behavior.



how the test was conducted...

Techniques which were used for testing :

Interview
Videotaping
Still photography
Field notes.

Since the scales of models were varied thus the testing was done at different levels.

For 1:1 scale model of the ribbon curtain:

- Installation was done.
 - Videos, pictures and interviews were conducted to capture people's reaction.(including customers, owner and the passerby)
 - for customers: User feedback form was filled.
 - for the owner: interviews were conducted and was captured in a video.
- (First reaction after installation and reaction after a day was captured to test the better feasibility of the product.
- For passerby: pictures were taken to capture reaction.

For 1:5 scaled models of the craft shop:

Reaction and suggestions of the owner was documented and captured through videos and pictures.

For prototypes of the bakery shop:

Reaction and suggestions of the owner can be documented and captured through videos and pictures.





Initial look of the shop



Site deatil was little different from what was assumed- no cieling was there to the canopy where we were about to drill the channels for the curtain



some alterations were done for the fixing. Curtain channels were removed from the initial design and the already existing structural members of the canopy were used to fix the curtain



the owner of the shop was very excited .He himself got all the tools required.

On site activities...



some friends were called upto help during fixing



central plate was drilled at the center of the canopy.



finally the bamboos with coloured ribbons were hanged along the entrance.



Final look of the shop.



Mr. Omar Valencia
Owner
"Oxalla Productos De Botanica"
1653 W, 18th Street Chicago, IL 60608



Before installation

"I am Astonished"

I am very excited, these colours are so vibrant.
it made me remember my hometown in Columbia with those "Valva bamboos".
The colours of the ribbon look complimentary to the shop. "I like colours."
these curtain pieces look different from usual. it produces very different emotions.
I am feeling excited when I look at them.
It's like a Possession, I don't want kids to ruin it.

OWNER'S REACTION



After installation

It's looking gorgeous, beautiful.
I like it because people are coming and seeing the place. - It's nice.
I like the bright look of my shop.
It seems interactive to people. they are passing through the shop while touching
it and playing with the sounds of the bells. It also makes me aware that some customers are around.
It's looking Perfect.



After one day of Installation

Bells are hitting the glass window., though it doesn't matter till it doesn't break the glass. ;)
We can put some glittering stars to make them visible and attractive in the night.
Though with Mexican community it is suiting best but since Americans are more liable, they can even comment on the security issue as it can hit their kid's eye while walking.
"Can I use it in one of my Upcoming exhibition just to state the Identity of my shop."
I preferred taking it out in the night because I don't trust drunks coming out of a nearby Bar.



People were asked about some simple questions .
Variety of people come to this store...with a wide range of age groups.
customers liked the product and wanted to have it in their houses too.
the common reaction was that the curtain was giving a festive mood to the shop.



Bamboo and ribbon curtain

Date: 6-17-08

Time: 12:50

Name: Guillermo Treviño Place: Chgo Age: 30
Sex: M

☐ Yes No

- Are you a regular customer? A couple of times only
- Does the curtain seeked your attention? Oh yes, very distinct; colorful.
- Do you like the new appearance of the shop? Very much!
- Is it giving a different identity to the shop? Has kept up with the art theme
- Do you feel it's a different experience passing through the curtain? Yes.
- Do you like the colors of the curtain? Love them, reminds me of Tibetan Art
- Have you notice the sound coming from the bamboo and the bells? The bells yes
- Do you want your friends to know about this new curtain? Take photos, so, yes!

Special comments:

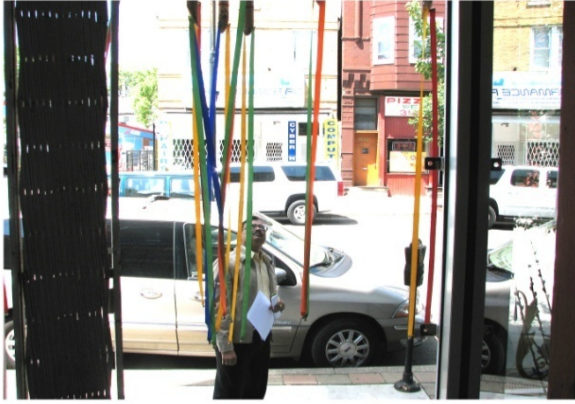
I think it is a wonderful addition to a fine store.
I've never seen anything like this, only remember a Budha festival last year with streamers. I absolutely love it.

Thank you for filling up the form.

Have a Nice Day!!!

Customer's Reaction

Passerby's Reactions



Some of them stopped and observed the curtain, some just passed over the curtain with a single glance, some were surprised with this new addition, some touched it and passes through the curtain while listening to the sounds of bells and bamboos.



near by shop owners and friends came to see the happening as it seemed like a festive season to them.



The Bakery Shop

Products



Roller for making patterns

We are using a similar kind of roller but it's a big one without any markings. the size is quite small. but I like the handle, it's a new way to hold because in our rollers , we hold it from both the ends and it becomes quite difficult to work.



Letter stamping

This seems to be a good idea, we can use it for different occasions ,happy father's day or happy mother's day. It will create a variety in the shop for sure.



For making jam biscuits

This is something very new to us. we are making jam biscuits since so many years with same design but never thought of making it in different shapes. Can we put these moulds in oven too??



Stencils for topping

We make big cakes and we do not allow customers to participate in our working zones. We keep our baked stuff outside the working zone from where customers choose it themselves. No attendee is there to help them. But through this product we have to provide an attendee every time for cleaning and resetting purpose.

Owner's Reaction

Documentation of experiences

The project was a combination of different learning processes and very new experiences for every individual.

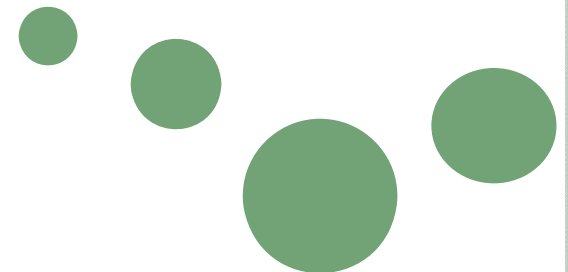
This documentation involves the compilation of experiences of students for the whole project.

Thus It can create a base for redefining the process that was followed during the course.

- Students felt that it was a nice platform for learning this new design phase.
 - It was nice to know the importance of communication media and its effectiveness in driving the design process.
 - A new design approach was made which gave different learning experiences.
 - In different facets of design process, importance of group work was felt.
 - It was a great experience to move around in slums and to know their networking and business strategies, and also to understand their livelihood from a closer perspective.
 - A different learning was made as a designer which differs from the users perspective, where economy plays a major role.
 - To study the needs of people abroad and to deal with the new kind of users was a nice experience.
 - During the process, several new books and experiences were shared which was like an addition to the design knowledge. Also some new business related terms were introduced which was again a nice addition.
 - Interaction with other design students was the experience of its own.
 - Overall final design ideas came out pretty well which was an addition to one's confidence in the field of field.
- 

Along with the above, there were some problems which were faced by the students during the course.

- Discontinuity in communication within designers at two sites slows down the process.
- It was felt that Communication media should be handled carefully otherwise the flaws gets multiplied and so does the effectiveness of design.
- Since every person have different attitudes at different points , it was quite difficult to come to the outputs in a given time frame.
- Since online communication was the only media to put up your ideas and exchange different views, but inconsistency was felt at every point and responses was not hundred percent from both the sides.
- Also one more important thing was noted that some details get lost while communicating, so documentation at every point was needed .
- It was felt that the process took more time as required , may be because of communication lack within the counter groups.
- Schedule or because of time lag between classes of two sides was different which created a barrier in driving the design process.



SPECIAL STRATEGIES EVOLVED

During the design process, since long distant designing is a very new approach, some special strategies were evolved.

One of them was the **Use of analogies.**

An analogy is a particular form of thinking or reasoning in which the properties of one object are thought in terms of a second object which is different but has certain properties in common. More specifically, they are used to explore new functions, new features and new applications for a product.

But particularly, in this course of long distant design, where the site was experienced only by imagining from the description received, it was quite difficult to understand the real scenario.

Major concern in distant designing is transmission of data in the exact manner the way it is conceived on site. For these, designers have the option of sharing the data by means of video taping, photographs, special description along with the visuals and also through enquiries and giving protocalls. But even after doing all this, it is always not possible to get the same feel as can be experienced by physically visiting the site.

Now the question comes, like how to get a similar feeling without being there at a particular place? The world of “Analogy” gives us this opportunity of experiencing a similar feeling.

Use of analogies gave us the freedom to achieve completely new solutions to problem by discovering how the problem is solved or partially solved in a totally different context.



Following are the examples used in our academic project of “enhancing slum business by design intervention”

The two schools of students exchanged their data collected at Powai slums and Little Village, thus in the meantime, while we were sharing the initial visit data, somehow it was felt that the exact scenario cannot be experienced until and unless students themselves visit the place. Which was not possible. But through this analogy learning it was made possible to understand the similar way things work at a different context.

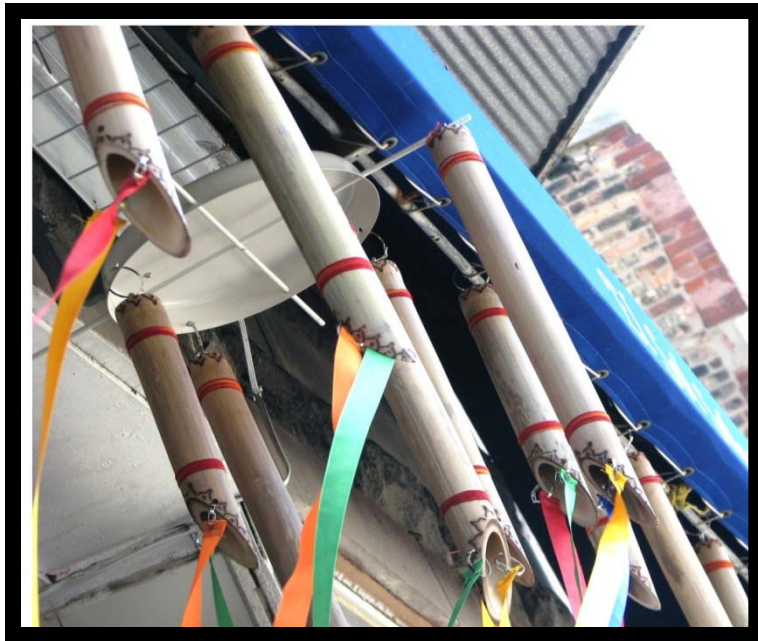
If we take small examples of businesses studied by a team of students, IITB students, studied the setup at Balwadi, and the counter students at IITChicago studied the setup at the craft shop. Both these setups involved multi tasking environments and thus with the use of an analogy, it became much simpler to understand and imagine the environment at respective setups. Thus even by not being present physically on site, analogy of similar environments can be compared to get the feel of that particular place .

Further, other strategy which was evolved during the course was of **“communication through Voice over videos”**

Videos are supposed to be one of the best analyzing devices. But at different contexts, where there is a difference in the settings and even local languages, putting a voice over was the best solution resolved. Thus through this, students got rich and deep data about attitudes, behaviors and contexts using this method.



DESIGN REFINEMENTS



Problems-

- Chicago being a windy city: bells were hitting the glass.**

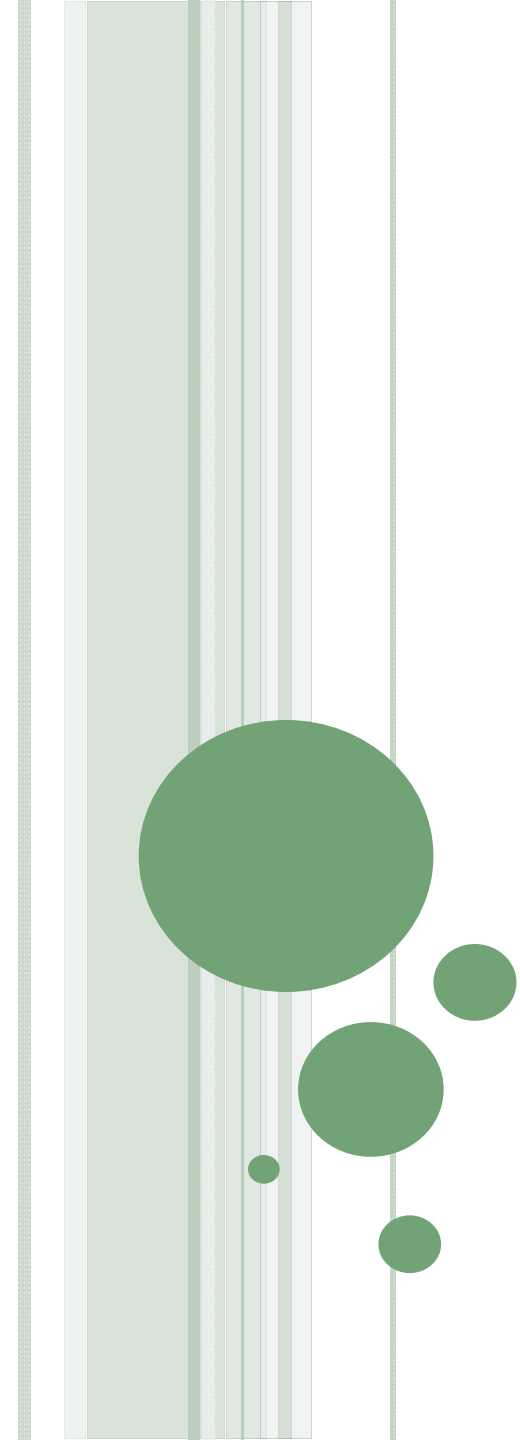
Initial motive of bells :the basic motive of putting the bells was to create sounds and to give weight.

Solution : the position of bells from the curtain ends can be changed to a place near the top ends, so that , the weight is retained and also does not allow the bells to hit the glass panels of the shop.

- In the night curtains are not visible because there is less light at the entrance.**

Solution : Some glittering sequence work can be done on the ribbons, which will shine when light falls on them.



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CONTACTS

•Prof. Linda Pulik

Adjunct faculty, IIT Chicago/ Honeywell Inc

pulik@id.iit.edu

•Adisorn Supawatanakul

Adjunct faculty, IIT Chicago

adisorn@id.iit.edu

Tel : 312-804-3100

•Matt Guilford

Program me manager at the city of Chicago

matthew.guilford@cityofchicago.org

Tel : 401 742 7471

•Omar Valencia

Owner of the craft shop – “Oxalla”

1653 w.18th street Chicago IL 60608

oxala1653@sbcglobal.net

Tel : 312 – 850-1655

•El Paraiso

Bakery and pastry shop

1156 w , 18th street Chicago Il 60608

312 – 733 - 8166

