

Design for All



Design for the Bottom of the Pyramid

Guest Editor : Prof. Puneet Tandon

PDFM Indian Institute of Information Technology, Design and Manufacturing
Jabalpur

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Chairman's Desk:



Dr. Sunil Bhatia

Why man does try to think for chasing the big ideas that demands huge resources and risk stakes are extremely high but sometime successes leave an impressive mark on humanity and generally at initial stage it affects the life style of nearby people with its good or bad outcomes. It takes its own time in defusing its outcomes among masses and gradually it turns to habit or part of life style or transforms culture. Have we given any thought that these successes at what cost of huge resources? Indian cookery was without the potatoes, tomatoes and chilies before the introduction of Portuguese traders in India. These small items have affected the entire population and no Indian can imagine the food without these items. Other side nuclear reactors impact on masses is negligible and consumes huge resources. What bicycle or two wheeler automobiles did social change we have not witnessed with huge automobiles? When ordinary person peddle or drive the vehicle he enjoys tremendously compare to traveling by airplane. Design of airplane gives sense of pride of science and technology where passenger's participation is negligible , emotional association is missing and lives under fear of untoward incidence. Other side peddling or driving

vehicle develops emotional equation and they enjoy because everything is their under control. Why do we ignore small acts that can also give better goodness? Society is part of nature and it never allows us for exploiting huge resources and it encourages everyone to participate in its own way with little resources for experimentation of their ideas. All living beings invent and reinvent new techniques for survival by using little natural resources in long duration and sometime it takes million years to evolve for countering the problems. Man is exception who has thinking capability and exploit optimum resources and does wastage in general and in exception proved his efforts beneficial for society. Nature believes little success will benefits the locals and will spread among masses in due course of time if it has acceptance from users and other side failure will be buried without much affecting the locals. Dr June MacCarroll survived with road accidents and found she would have avoided this accident if there was white strip in mid of the road. No one took her seriously and she did herself to paint the long stretch of the road. Results were astonishing and ultimately a design in remotest part of the world turned to international standard. Why does man live under the trap of thinking of big ideas and reason is still mystery for us? In reality progress of the society is contrast to human nature of thinking big and various series of little successes gradually clubbed in centuries and forms different things that creates huge impact on human progress .Human progress is gradual, stable and scope of improvement is inbuilt character and nature inner wishes are that there should not be drastic progress in human development. Gradual changes suit the human minds where abrupt changes bring fear of hidden consequences. It might be dream of every civilization to reach and

unfold the mystery of moon but it came true only in 20th century. It was beyond the imagination that Neil Armstrong will land in moon in mid of twentieth century. It was the cumulative efforts of million years of human civilizations that keep burning desires to reach the moon by designing mythological or social stories, poems and all sorts of performing arts and these efforts kept alive the objective to explore moon by landing . Ultimately cumulative efforts of known and unknown heroes that made this dream come true. It might be possible men might used their mighty force to throw stone toward moon out of inbuilt character of frustration. Other side some might have realized with wisdom we can solve the problem of moon. Design of kite by unknown hero was an attempt in direction of designing the airplane and he developed the blue print by prototyping the plane will be something like in future. Ancient peoples understood that three forces are working to fly the kite and thread should be placed in such a way to hold the kite that triangular band where two sides of it should hold the kite and one side that is shorter should be at upper side and longer end should be at the bottom . Third side should be in the hand of flyer that controls the movement and kite should fly against the wind .To move the kite upward flyer should either pull the holding thread or releasing or giving jerk helped in flying. It was marvelous piece of design. In modern time we used the same basic design of airplane but removed the holding thread and attempted to make without thread. When I see a child is running holding the colorful paper windmill toy against the wind that simple design astonishes me. It might have started with folding leaves and as our technologies improved it changes to paper and plastic. I salute the unknown hero who thought by folding the leaves in four petals where striking air will pass from folded leaves in such manner

it will rotate clockwise. Wooden top that rotates by encircling the rope around its surface and throw in such way it rotates on ground. Who has thought that rotation can be achieved by using rope? Most of the smaller motor of generator for starting has pulling rope. Human languages to evolution of man to shaping the thought to progress the idea to make realization to dream come true in million years. Reason is some idea strikes in human mind in one place and other associated ideas generate in another places and time takes its own time to defuse for birth of new format and that proves significant impact on humans. I do not where our modern society deviated from thought process what we have inherited from our ancestors. That time communication used to take unusually longer time but basic thought were mature with time and powerful that has revolutionized the progress of mankind. We have fastest communication means but immature thoughts are surfacing and before it attains maturity it spread with one click for communication but basic immature original thoughts loses its relevance with passage of time . Our world is hungry for new ideas but we are focusing on development of applications of existing technologies. Idea of flying kite in rain by Benjamin Franklin has revolutionized the society by inventing electricity. Idea was small but it was complete with goodness. 'Goodness of small act.' James watt's kettle of boiling water idea was small but revolutionized the industrial movement. George Boole concepts of logic gates were small idea but it led to invention of computer. Marconi's concept of radio has given birth of audio transportation. Alexander Bain idea led to modern television that was nothing but small act of goodness. Why do modern designers not think of small ideas that have potential to revolutionize the society?

We are ungrateful to those who have given us small concept but it proved pillar of progress of the society. Simple concept of rope and various knots extended the capability of human power and given us the idea how to be independent in life. Earlier many men were performing some job but rope has eliminated a few and knots have further replaced person who was supposed to hold the other end. Design of wheel has made the world rolling. But thinking of teeth to counter friction on wheel has revolutionized the world by introducing the concept of transfer as well as for accelerating or retarding of power and in general term we call gear in automobile. When ancient person started tying the bunch of broken dry logs with rope , he was aware that many logs add strength and reducing the number made weak. This simple knowledge led to think of cutting tools. That idea forced them to design the axe that can cut by physical power and that helped in learning the art of cutting by striking with some angle. Straight hitting the log with axe made their job tough. The simple concept of weaving led to design of mesh. Earlier people were using clothes for physical segregation of mixture and in Iron Age they used iron mesh that replaced clothes. In Stone Age sharper stones were used to kill the enemy. Sometime they killed by striking against the holding stone and sometime by hitting from safe distance. That basic concept is still used in modern time and every civilization used these basic concepts but forms are changed as their knowledge of technologies improved. Initially they might have designed sling shot, catapult, bow and arrow, spear, javelin and many more but it achieve height in the form of modern weapons in present time. What did compel to design axe? Is it outcome of their improved knowledge? What force was guiding them to look for Iron Age and that led to design axe. I can understand the

use of leather in their lives because it was left over of foods as animal skin but what did make them to discover iron from soil. It is still mystery for us. Was it iron first metal separated from soil or something different? Is it idea of iron outcome of volcanoes? As melted lava gets colder it takes uneven shape of strong stone? Was it initially acted of replacing stone with iron? As they realized melted lava could be shaped by placing in different pots that germinated the idea of moldings. Traditional people still uses leather bag for pumping controlled air for attaining high temperature for melting and earthen pot as molding for desired shape. They learnt the art of quenching in water or oil for hardening. Modern people are using high temperature furnace and dye as well as molding but basic concept is still in use for hardening. Discovery of gold was no use to ancient person because it lacks hardness and he enjoyed with iron and it revolutionized the society.

Nature entices man into the adventure of metallurgy by an initial gift of an almost magic charm. Gold, the most attractive and precious of metals in every society, is also the easiest for primitive man to acquire. Gold is bright, incorruptible, malleable, and appears in pure form in the beds of streams. Once seen, acquiring it is just a matter of picking it up. It is the discovery of fire and its management developed the art of smelting. It is ancient practice of smelting where they learned the art of segregation of different metals because they understood that it has composition that has different melting points. First metal was extraction of copper by heating the rock. This small idea encourages them to experiment with different natural resources for segregation that led to variety of metals and non metals. Earlier segregation was limited by application of water or air or using clothes but fire opened up new dimension. Later on

they had designed alloy of bronze by mixing tin with copper. This knowledge was improved and responsible for Iron Age. Earlier man was using rope or various knots or wooden nail but it was improved by designing nail and screw with iron. Design of screw fascinates me and how beautifully mind has developed such a design just by rolling triangular shape of metal sheet over simple nail. The design of paper pin is miniature design of nail to hold soft papers together. Recently I observed that design of buckle of belt for holding items is extension of knots. Buttons with hole is further extension of knots and zip mechanisms is one of the highly innovative designs. Ultimate simplest design is by modern person is Velcro and reason of popularity among masses is its simplicity and reliability. Comb, mirror, needle, scissor, clip are example of simplest but amazing designs. Idea of hammering and grinding is from the primitive time and it is the smallest act that has changed our thought process. Imagine modern world without hammering and grinding and we will find our world progress at halt. Primitive people used water or liquid in very limited way because they were with limited knowledge. They used liquid for transportation or soaking to make the item soft or for food. It was the modern man who took liquid properties that height that no one has ever imagined. They used liquid petroleum by burning under control condition for designing new world of transportation that was earlier nonexistent. How our ancestors got the idea of glass that too coated with mercury for reflection really unthinkable design by any living beings. Invention of glass has corrected our eyesight as well allow our vision to see beyond what our eyes can see. It has revolutionized the thought process of mankind. Idea of printing just by accidentally found the reverse

impression of cut potato has helped in designing auxiliary memory and that helped us to pass our knowledge to future generations.

Society moves on with the art of giving not by art of manipulating. Those wished our small contribution will benefits the society in large sacrificed their own benefits. Modern society is moving on contrast to philosophy of our ancestors 'small act of goodness' and what they did and sacrificed. We are not carrying their legacy of sacrifice for benefits in general rather we are under the influence of selfishness and greed that allow us to think what I will gain out of this act and why should I bother how people in general suffer. What appears as large scale social change to us in reality it begun with humble and small steps. I personally admire the design of cup but design of handle astonishes me. Design of cup might have come for holding the items either to meet the transportation or discovery of fire allowed to use for heating of serve hot .Design of handle just adding the small curve attach in such way it can bear the holding items weight and protect the user from heated holding item of anything that can damage the holder. It was really amazing concept and it was indication that their minds were scientific but theories were absent. It was small act for goodness.

When carpenter while working places graphite pencil to make marks on wood between ear is indicating that we have inbuilt character of designing. I notice when line man climb the stairs to correct the fault on overhead live wire and need player to tighten the wire he places it back of the color of his shirt to make his hand free for climbing. These small ideas indicate that we still think innovatory and creatively in small ways. A small child peddles the bicycle and as he feels expert he keeps attempting to peddle the bicycle without holding the handle bar. When a joker in circus performs multitasking

while peddling the bicycle it astonishes and that provides entertainment. What we wish to do, we cannot do and joker is performing is reason of our enjoyment. Why do every generation attempt to be free as much they can is still mystery. When we can verbally communicate but we communicate wherever it is possible by using our body parts and we enjoy doing it. When a young man or girl wishes to communicate they invent new vocabulary to avoid the interference of others in their relationship. Sometime they hang the clothes where it is visible and no one notices what for it is spread and presence or absence communicates to designated person. They blink or twirl their lips or whistle or some other method to communicate uniquely. This habit is clearly visible in human race when the idea of erecting the house germinated in his mind. Idea of building house might be possible started with circular to meet the challenges of vagaries of weather later on they changed to other geometrical design. It might be possible they have understood the circle has maximum strength but later on other geometrical shape surfaced where privacy and freedom became centralized idea. Everyone is aware rectangular shape needs more resources compared to circular and they realized that it has limitation of expansion. Man's inner wish to be free was curtailed. In Stone Age they built houses by using walls made of stone or wooden posts joined by wattle-and-daub panels, and a conical thatched roof and with the invention of iron they overcome limitations and modern society by using reinforced concrete structure can make any shape of any height.

Dr. Puneet Tandon is head and Prof at IIITDM Jabalpur India and our Guest Editor for this special issue. He has justified his role and helped us in our monthly international publication. My special thanks

to Mr Amaltas Khan who has coordinated all activities with cordial and with dedication. I admire energy and enthusiasm of students who did excellent job of writing such a beautiful articles in short notice. I salute Prof Puneet Tandon for helping us in brining out special issue in time.

With regards

Dr. Sunil Bhatia

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Forthcoming issues

April 2015 Vol-10 No-4

Debra Ruh is a Global Disability Inclusion Strategist, ICT Accessibility Training and Social Media Thought Leader on Disabilities. She focuses on Disability Inclusion, EmployAbility, Corporate Social Responsibilities, ICT Accessibility, Corporate Social Responsibility and Social Entrepreneurs. She is also the author of several books including "Uncovering Hidden Human Capital: How Leading Corporations Leverage Multiple Abilities in their Workforce" and "Finding Your Voice by Using Social Media"



May 2015 Vol-10 No-5

afUD (French Association of Universal Design) President Jean Rene Moussu has accepted our invitation for Guest Editor for our special issue. He is enthusiastic to popularize the concept of Universal Design in his country because he feels it is social responsibility of every citizen of the world to make the world accessible to all. He is inspired by Ron Mace and believes his word his philosophy



***The UD is a collective thought. Think different !UD*think! The UD* is notan evolution, it is a revolution.**

June 2015 Vol-10 No-7

Dr. Antika Sawadsri is a full-time lecturer in the School of Interior-Architecture at King Mongkut's Institute of Technology Ladkrabang (KMITL). She received a PhD from the School of Architecture, Planning and Landscape, Newcastle University, UK. She has qualifications on interior Architecture and Planning and is a specialist in an



interrelationship between social construction of 'disability' and the designed environment. Her academic interest focuses on inclusiveness in the process of creating living spaces. Recently, Antika has taken parts in both the State's agencies and non-government's movement in mobilising equal access to the buildings and city of disabled and ageing groups in Thailand.

July 2015 Vol-10 No-7

Humaniteam is a design laboratory which focuses on Health and Disability-related issues. We believe that the practice of a sport is conducive to enhancing the skills of people in disability situation in their everyday life environment.

Design acts as a bridge between each pole of expertise, thereby creating a common language and translating it into objects or services.



HUMANITEAM is really passionate by design for All. Many projects of UD are ongoing. Ms Claire Fauchille will be the Guest Editor.

August 2015 Vol-10 No-8

Dr. Bijaya K. Shrestha received Doctoral in Urban Engineering from the University of Tokyo, Japan (1995-'98), Master in Urban Design from the University of Hong Kong, Hong Kong (1993-'95) and Bachelor in Architecture from the University of Roorkee (now Indian Institute of Technology), India (1983-'88). Dr. Shrestha has



got working experiences of more than two decades. He had already served to the Department of Housing and Urban Development, Ministry of Housing and Physical Planning, Government of Nepal, United Nations Centre for Regional Development (UNCRD), Japan and various architectural schools in Nepal before taking the present job at Town Development Fund (TDF). He has initiated a new master program in Urban Design and Conservation at Khwopa Engineering College, Purbanchal University, where he served two years as Head of Post-graduate Department of Urban Design and Conservation.

Dr. Shrestha is the recipient of numerous gold medals for his excellent academic performance and decorated by 'Calcutta Convention National Award 2006' by Indian Society for Technical Education for his best paper at the 35th ISTE Annual convention and National Seminar on Disaster – Prediction, Prevention and Management. He is also member of numerous professional bodies and life member of various alumni associations. He has already contributed more than five dozen of papers, published in various forms: book chapter, international journals, conference proceedings, local magazines and journals including in local newspapers. Moreover, he has been invited in numerous international conferences for presentation of his research findings. Finally, his

field of expertise includes sustainable urban development, disaster management, and housing, local government capacity building and development control. He will focus on universal design concept on Nepal.

September 2015 Vol-10 No-9

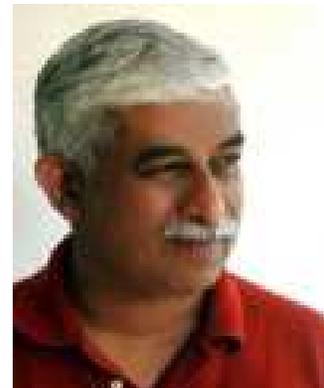
Min Wang Dean of School of Design CAFA, Beijing Beijing City, China Design Currently with AGI, China Central Academy of Fine Arts School of Design and previously worked with Square Two Design, ICOGRADA, Beijing 2008 Olympic Committee. His education is from Yale



University will be Guest Editor and he will highlight the contribution of China in Universal Design.

October 2015 Vol-10 No-10

Prof Ravi and Dr Ajanta Sen of IIT Mumbai India will be the Guest Editor and theme of the special issue is Design and Children.

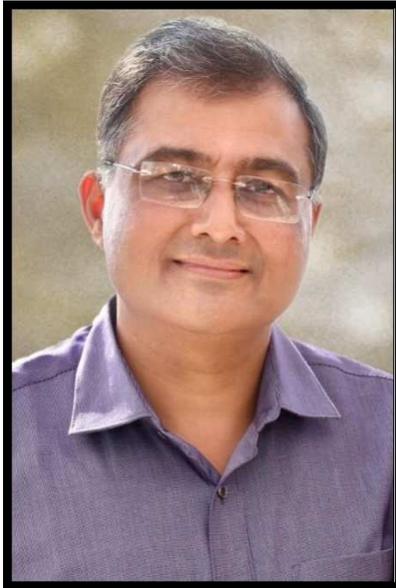


November 2015 Vol-10 No-11

Ewa Golebiowska, Poland is the president of EIDD Design For All and she has accepted our invitation of Guest Editor and she will invite the authors from European countries for special issue.



GUEST EDITOR:



Dr. Puneet Tandon

Dean, Planning & Development

Professor of Design

Professor of Mechanical Engineering

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He is a joint Professor of Design Discipline and Mechanical Engineering at PDPM Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India. His primary research interests are Intelligent and Innovative Product Design, Computer Aided Design, Nature Inspired Design, Advanced Manufacturing Technologies and Micro fabrication. He graduated in Mechanical Engineering from NIT Kurukshetra. He received his Masters and Doctoral degrees from IIT Kanpur. He has authored more than 145 papers in referred journals and international conferences of repute. He has been author to one text book titled "Cutting Tool Geometry: 3D Perspective" and a few conference proceedings. He was also organizer of International Conference on Innovations in Design and Manufacturing (InnDeM) 2012 and Design Workshop (DeW) 2014

and Design Workshop (DeW) 2010. He is Principal Investigator to a joint Indo-Japan Project, and to numerous projects sponsored by Department of Science & Technology, Department of Atomic Energy, Ministry of Human Resource Development, etc. He is a member of the International Programme Committee of CAD Conferences, Conference Chair to ICMME series of conferences and on advisory committees of various international conferences. He is a co-editor of one International Journal on Manufacturing and has been reviewer to several international journals.

Design for the Bottom of the Pyramid

Professor Dr Puneet Tandon

India is a country where majority of people live in scarcity and most of the people are still striving for their basic needs. The World Bank in year 2012 estimated that around 300 million people live below poverty line. However, there are public and private policies and investments in fulfilling the requirements of basic needs but they are insufficient as the facilities do not reach most of the people.

Products are a medium to facilitate the requirements of people. If a product is able to enhance its value, may be due to functionality or emotional attachment, than the price of the product is not of much significance. For a village commuter who travels 20 km daily, a 2000 rupee bicycle is far more valuable that for a cyclist who uses it occasionally for fun. Ironically, creating equal opportunities for every class of people is a responsibility of the developers of the product. Sadly, business is run by profit from the market and not by the value an individual cater for a product. If products can be made available to each class of user, they will create an important role in evolving a well-being society. In recent years, there are many such methods for product development which are primarily based on value addition for the user and rather than for profitability. Frugal design is one such method in which the focus is in reducing the cost and complexity of the product as much as possible without compromising on the basic functionality. Some of the known examples are "Tata Swatch", "Mozilla \$25 Smartphone" and "Tata Nano". These products focus specifically on reducing the price and increasing his acceptability of the market as much as possible.

Frugal designs are highly dependent on the new technology. As soon as a new technology is developed and launched in the market, it serve as an opportunity to increase the efficiency of the related product range. For example, with the recent advent of driverless car, the automotive research direction has been adapted to reduce material in vehicle structural design as a computerized vehicle has

less chances to event an accident. The human inside the vehicle will be safe in a car with comparatively lighter structure of vehicle. This material reduction would reduce the input cost of the manufacturer and in the process increases profit. However, technology development will be more effective at grassroots, if it is made affordable to the probable users at first priority rather than profitability of the producer. In this case, Mozilla's \$25 smartphone is an appropriate example as the product is targeted to majority of population in developing nations. Of course, Mozilla is making profit out of it but they are making the technology to reach the bottom of pyramid people as well. The true sense of technology outreach can be seen here.

Most of the industries are profit dominated and could not perceive the scope of technology as they donot see the hidden market. Institutions at the other end also play a broad role in novel research and technology developments and they are liberal enough to invest in the development of frugal design and frugal innovations.

ThisInstitute (IIITDM Jabalpur)is focused on developing the products for the people at the bottom of the pyramid. We motivate students to work for the demanding sectors and make them realize the potential in such hidden sectors. Students in undergraduate programs and post-graduate courses are creating innovative solutions in different domains. The course structure has been designed to let the students' liberal enough to find a sector of their interest by identifying a need related to their domain of specialization. Some of the courses for UG and PG are as follows:

1. Design Workshop (UG)

Course Duration-1 semester

UG engineering students are grouped in 3-4 students with different engineering domain. They are asked to identify issues in sectors like medical, social security, agriculture, rural development, etc. by conducting users' survey and then trained to develop cost effective solutions following the generic product development process and frugal design process.

2. Fabrication Workshop:

Course Duration-1 semester

In continuation of the design workshop, in the fabrication workshop the students are required to fabricate the designs from the previous semester work. They are required to explore through manufacturing techniques in the industries and accordingly fabricate the designs. At the end of the workshop, the students are advised to go back to the end users to take the feedback and identify potential design improvisations.

3. Product Design I (PG):

Course Duration-1 semester

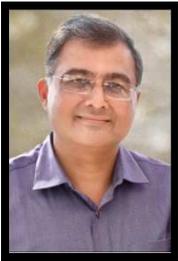
Post graduate students from multiple disciplines and varied experiences are required to select a working sector of their interest. Students along with their experience in different sectors are carried through the professional product design process. In parallel, discussion based workshop sessions for product design and fabrications are conducted so that every project gets an input from specialist student from other discipline. Every student submits a working prototype of their concept as a submission.

4. Design Workshop II (PG):

Course Duration-1 semester

Design Workshop II is a workshop based exercise where the design projects are based on a theme. This year, the themes of the workshops are "Frugal Design" and "Design from Waste". Frugal Design, as the name suggests is a design focused to reduce cost and product complexity to increase affordability of the product. In "Design from Waste" exercise, students are required to identify non-recyclable household waste e.g. food packaging, medical waste, etc. and then develop a useful artifact competitive enough to survive in the market comprising similar products. The design and fabrication is also minimized so as to make it possible for an unemployed layman to make the artifact and in the process earn some remuneration.

Thus, the emphasis of the training being imparted through a cluster of courses is to not only enable the students to think in a creative manner so as to produce innovative solutions but also to imbibe a culture of producing responsible and efficient designs among them. Through the set of courses, it has been observed that to a large extent the objectives of generating effective designs are fulfilled.



Professor Puneet Tandon



Vipin Yadav is an architect doing his Masters in Design with specialization in interaction design. He did his under graduation in Architecture from Chandigarh College of Architecture (Panjab University). Looking forward for research and work in User interaction, User Interface and Human Computer Interaction.

His other projects include Digital media applications in Health Care, Real Estate, and Insurance etc. for different Multimedia Devices. His freelancing projects include Health Card Design, ORS packet Redesign and branding and identity for various firms.

Eco-friendly Toothbrush

Vipin Yadav

1. Abstract

The project is an attempt to enhance the brushing experience of an individual by designing a efficient, comfortable and eco friendly toothbrush. After continuous and successive developments in the toothbrush design we still have many issues with portability and disposal. The tooth brush is something that is being changed after certain period of usage.

The project approaches the solution by following product design process. It involves study of tasks performed by individual along with their interviews, dimensions of the existing most used toothbrush, and requirements of the individuals and the human factors to be considered. Considering needs various concepts are generated. Selected concepts are then evaluated to finalize the concept and final concept is further worked upon to achieve its detail design.

Currently there no such eco-friendly toothbrush which would meet these requirements except for the battery operated toothbrush. The proposed design would make an individual realize the importance of reusing and making them aware about the ill effect of waste disposing.

The product basically resolves portability issue, eco friendly issues and personalization of products.

2. Introduction

The toothbrush is an oral hygiene instrument used to clean the teeth and gums that consists of a head of tightly clustered bristles mounted on a handle, which facilitates the cleansing of hard-to-reach areas of the mouth.

Toothpaste, which often contains fluoride, is commonly used in conjunction with a toothbrush to increase the effectiveness of tooth brushing. Toothbrushes are available with different bristle textures, sizes and forms. The predecessor of the toothbrush, the chew stick, first appeared in Egypt and Babylonia, and the earliest bristle

toothbrushes originate from China. Toothbrushes were introduced to Europe through merchants and travelers in East Asia by the 17th century. The nylon toothbrush was invented in the 1930s.

Thus we can see the journey of human kind from eco friendly to non eco friendly Toothbrush.

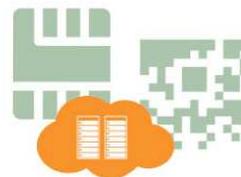
Problem 1 – The journey of human kind from ecofriendly to non-ecofriendly Toothbrush.



Problem 2 –Personalization of the toothbrush like other products.



Information is gathered about your interests and tastes from a wide variety of sources



Machine learning techniques refine your personal taste profile

Companies can offer individuals products and experiences that are nearly guaranteed to please you





Problem 3 –Easy and Portable toothbrush and paste.



(Toothbrush and toothpaste – takes more space)

Problem 4 –Easy to clean travel toothbrush.



These problem needs to be addressed ergonomically with optimized dimensions and which would serve needs of individuals and also help to keep the environment green.

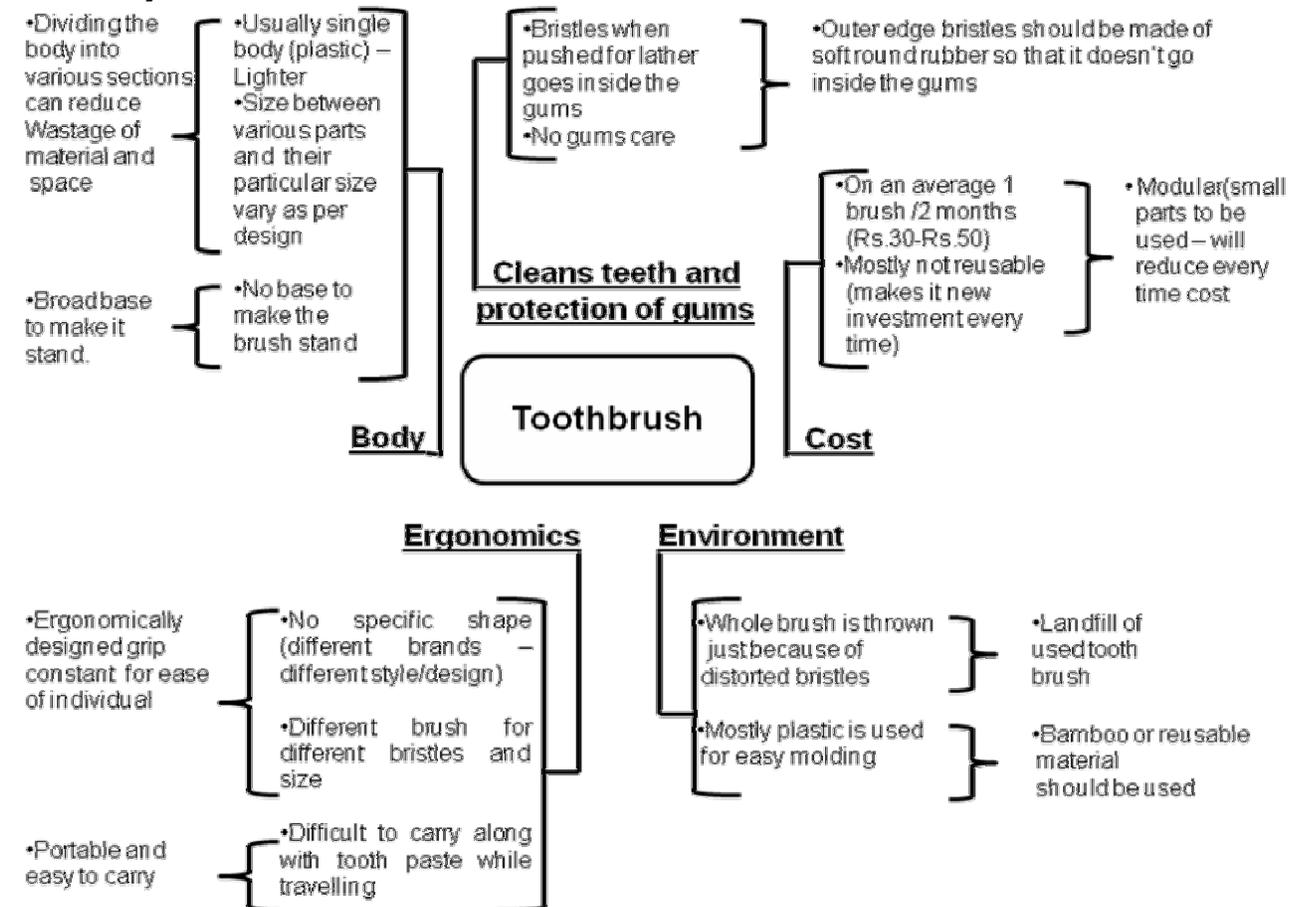
Areas we will be looking into:

• **Initial Research** : *aesthetics; ergonomics; anthropometrics; functions; costs; hygiene; Manufacturing processes; brand positioning; market demands; related and unrelated products; design history; competitors; pricing.*

• **Customer Research:** *This can be done in all class to get opinions from all range of people. Therefore trying to find out what the market demands. This needs to be done as rigorously as possible.*

3.Objective

• **Clearly defined customer needs.**



I. To design an ergonomically effective, comfortable, convenient and cost effective eco friendly tooth brush that can be reused.

- II. The design objective is to reduce land filling plastic and keep the environment clean. Thus making people aware about environment.**
- III. Trying to make the product more personal, modular and portable.**
- IV. The design which we are trying to achieve should be simple and can be mass produced.**

4. Need Statement

Need statement generated after interviewing and task analysis of people using toothbrush at home, during travel or at outdoor stay are as follows and is categorized into primary, secondary and tertiary needs.

Primary Needs

Designing -

- A reusable toothbrush.**
- An ecofriendly toothbrush.**
- a portable product (instead of 2 products)**
- Modular – can change as per need or desire.**

Secondary Needs

Designing –

- a meter or scale on toothpaste carrying container**
- easy to stack or stand on plain surface**
- New design/color as per mood or need.**

Tertiary Needs

Designing –

- the product should be easy to clean**
- related graphics which would give it an aesthetic appeal**
- cost effective**

5. Product Specification

The need statement generated is expressed in the “language of an individual who use toothbrush regularly”. In order to provide specific guidance about how to design and engineer a product, we establish a set of specifications, which spell out in precise, measurable detail what the product has to do to be successful. The specifications reflect needs and its technical plus economical feasibility. Specifications are typically established twice. Immediately after identifying needs and we set target specifications. After concept selection and testing, we would develop final specification.

Process for establishing the target specification is:

Prepare the list of metrics.

Collect competitive benchmarking information.

Set ideal and marginally acceptable target values.

Reflect on the results and the process.

Converting needs into engineering characteristics

Needs	Metric	Unit
Ergonomic design	Anthropometric consideration and evaluation, length of brush, adjustable parts size	mm
Easily store at washbasin counter or at shelf	Base diameter, length and height of the brush should be smaller than available space on washbasin counter	mm
Amount of toothpaste that is used	How much paste (volume) is used	mm ³
Easy to carry	Form exploration and corresponding dimensions. Shape of the brush and toothpaste holder	mm
lightweight	Weight of toothbrush	grams
Durable	Number of days before wear & tear	integer
Refillable toothpaste section	Modular design : Number of compartments or partitions	integer
Cost effective (Less as much as possible)	Cost of the toothbrush	Rs
Should have graphics which would add aesthetic appeal	Display area on toothbrush	mm

Since there are few direct competitive product in market for benchmarking, therefore we take the values by observation. We also consider physical, technical and other constraints that dictates the form, shape, size of the toothbrush.

6. Concept Generation and Selection

As we proceed from product specification to concept generation some points are to be kept in mind while generating concepts. These are the challenges in design which every concept should be able to address. The concepts needed to have following features like refillable, ergonomically efficient design, light weight, cost effective, durable, modular, easy to clean, easy to handle, stackable, easy, portable ,ecofriendly and comfortable to use. Based on these previously mentioned points concepts have been generated.

Two major challenges in design are

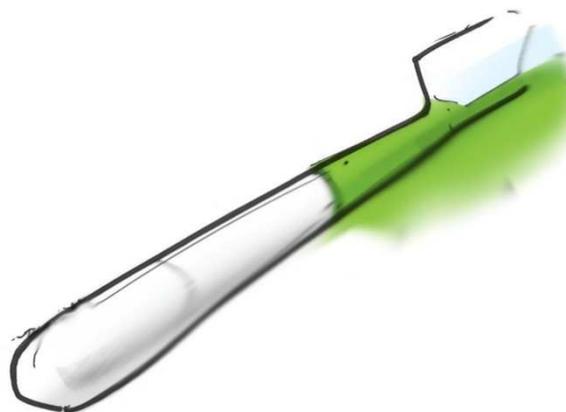
1. Form exploration

2. Material exploration (reusable or eco friendly material – bamboo, recyclable plastic - to keep it light and ecofriendly)

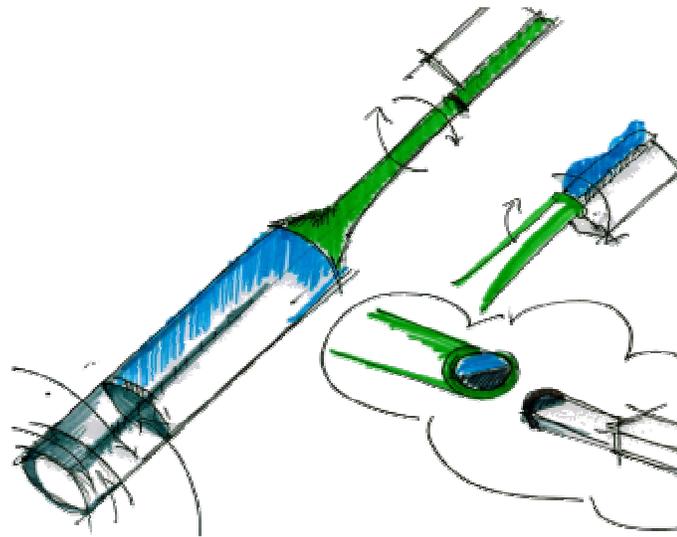
Form Exploration:

Various forms have been generated to best suit our requirements of ergonomic design, ease of use, easy to clean, modular design. By selecting appropriate form we can proceed to further concepts generation which meet the functional requirements, so that it can be stacked, easy to handle.

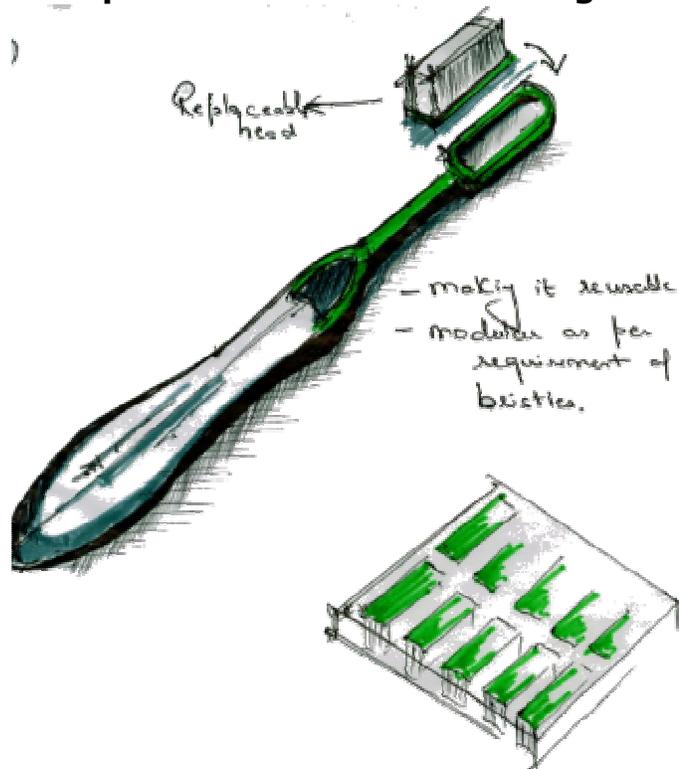
Concept 1: Detachable toothbrush neck and space for small toothpaste tube



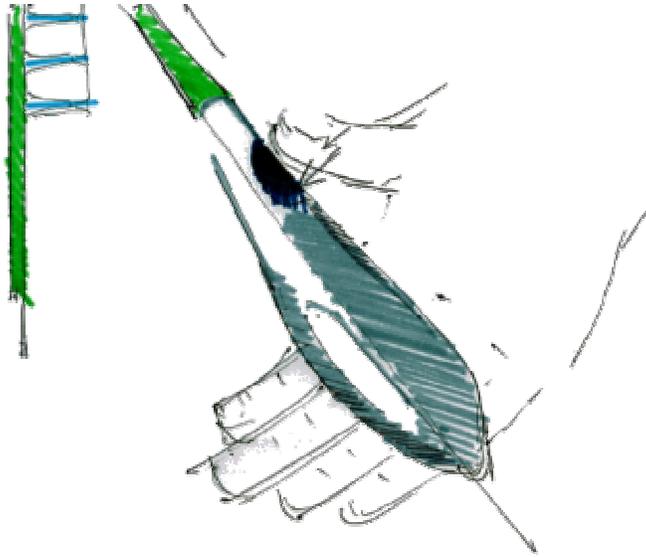
**Concept 2: Revolving base to push the tooth paste to the top.
Movable head to replace or to take the toothpaste on the back side of bristles.**



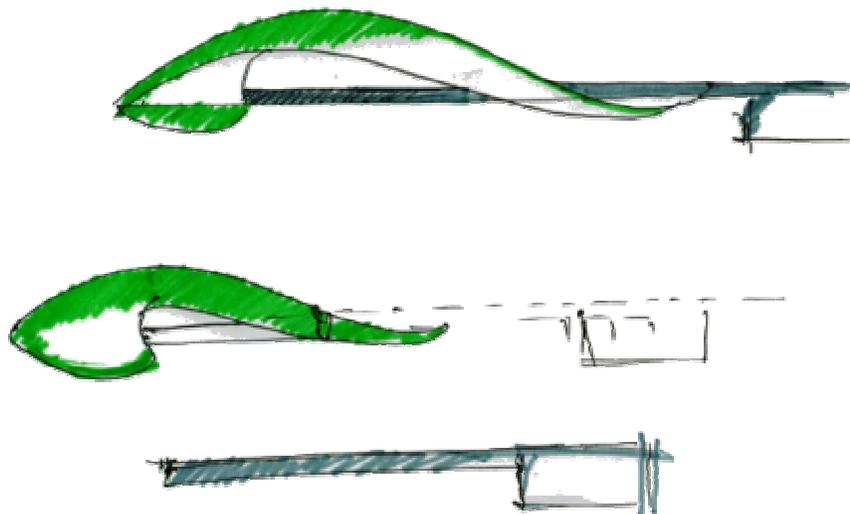
Concept 3: Replaceable head like shaving razor.



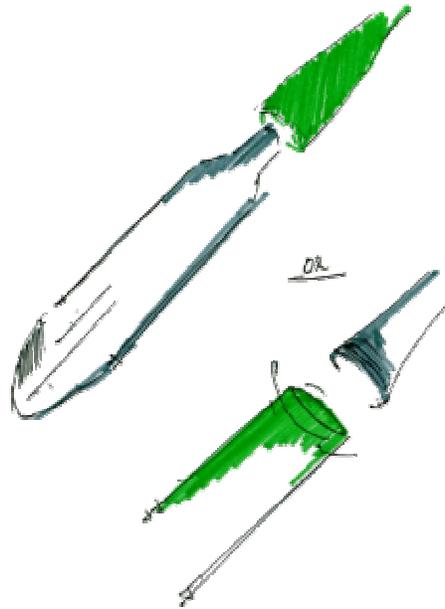
Concept 4: Toothbrush and toothpaste together, toothpaste comes out of bristles when pressed and thumb rest.



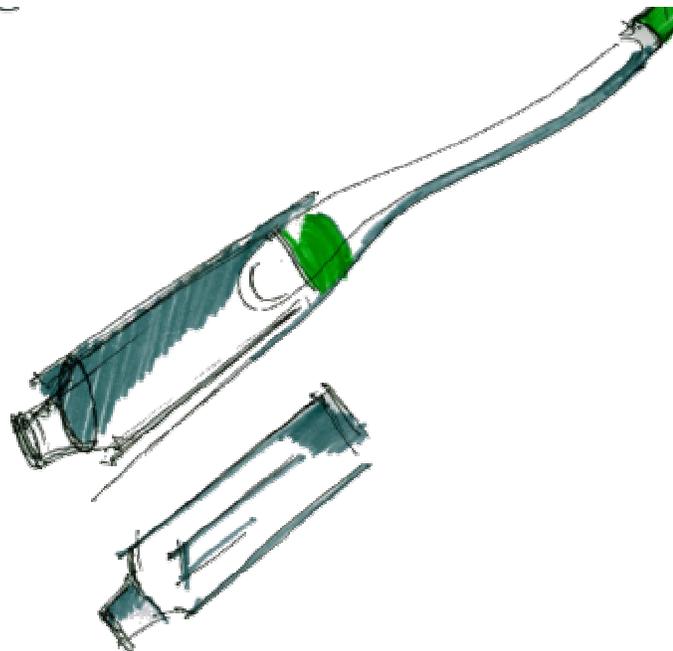
Concept 5: Replaceable toothbrush with thin neck material, just the grip remains constant.



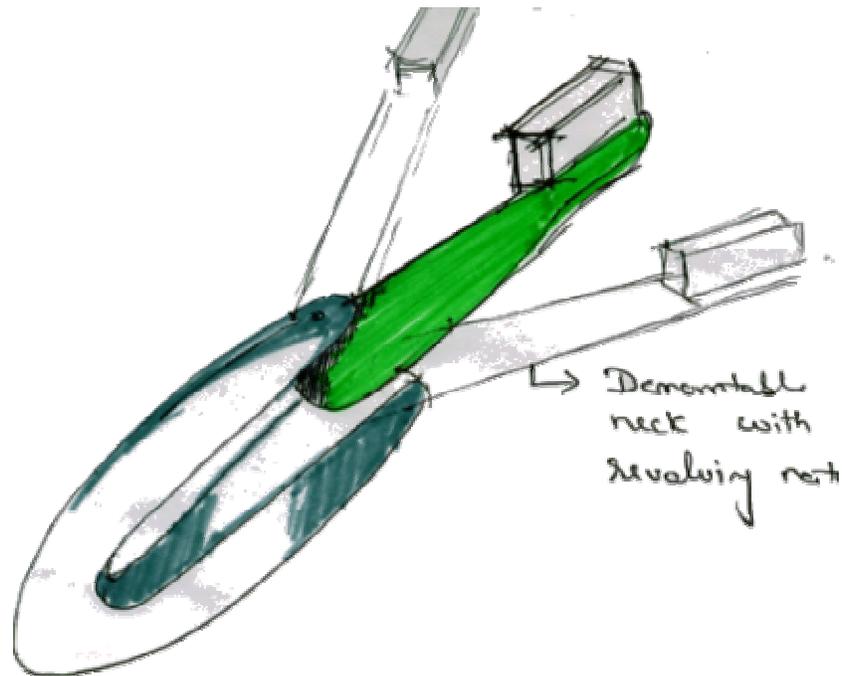
Concept 6: Replaceable neck of toothbrush, push mechanism or screw mechanism



Concept 7: Replaceable toothbrush head with space to keep toothpaste tube at the base /grip of brush.



Concept 8: Replaceable neck of toothbrush, revolving mechanism.



Concept 9: Concept for base – to keep the brush in vertical position so that its easy to keep it clean from surrounding



Concept Selection

Concept selection methods are used to narrow down the concepts generated in the concept generation step. The methods exploit the matrices as visual guides for consensus building among team members. The matrices focus attention on the customer needs and other decision criteria and on the product concepts for explicit evaluation, improvement, and selection.

Concept selection uses Pugh concept selection method. In this method a concept selection matrix is prepared and inputs (concepts & criteria) are entered on the matrix. A reference concept is selected with which the other concepts are compared and rated. The concepts are then ranked according to net score. The concepts above reference concepts are selected for concept evaluation.

Selection Matrix using Pugh selection method:

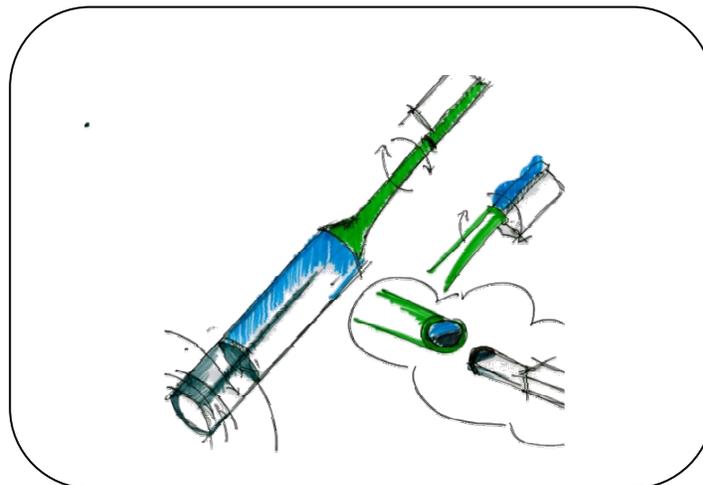
Selection Criteria	Concepts							
	1	2	3	4	5	6	7	8
Convenience (ergonomic design)	0	+	0	+	-	+	+	+
Accommodating tooth paste	0	0	-	0	-	-	+	-
Portable	0	+	-	+	+	+	+	+
Lightweight	0	0	0	0	+	0	+	+
Durability	0	+	0	0	-	0	+	+
Modular	0	+	+	0	0	0	-	-
Easy to clean	0	0	0	-	0	0	+	+
Easy to handle	0	+	0	+	-	0	+	+
Ease of manufacture	0	0	+	-	+	+	+	+
Stacking	0	+	-	-	-	0	-	-
Cost effectiveness	0	0	+	-	+	-	-	-
Reusable	0	+	+	0	+	+	-	-
Aesthetic appeal	0	+	0	+	+	+	+	+
Identifying authorized vendor	0	+	0	+	-	+	+	-
Ecofriendly(replacing small amount of non recyclable part)	0	+	0	+	-	+	-	+
Net Score	0	10	1	2	-1	5	6	3
Rank	7	1	6	5	8	3	2	4
Continue?	No	Yes	No	No	No	No	Yes	No

From Pugh’s concept selection method concepts are narrowed down and 2 concepts are selected for further scrutiny. Final concept is selected using a rated matrix .In rated matrix critical selection criteria’s are considered and are given weight-age and concepts are rated against selection criteria’s. Concept with maximum score is selected for development.

Rated Matrix for finalizing the concept:

		Concepts			
		Concept 2		Concept 7	
Selection Criteria	Weight	Rating	Weighted Score	Rating	Weighted Score
Convenience (ergonomic design)	20%	3	0.6	3	0.6
Environment friendly	20%	4	0.6	2	0.4
Lightweight	15%	3	1	2	0.5
Cost effectiveness	15%	3	0.45	2	0.3
Easy to clean	5%	3	0.15	2	0.1
Aesthetic appeal	5%	4	0.2	3	0.15
Portable/handy	20%	4	0.6	2	0.2
	Total Score	3.6		2.25	
		Develop			

From weighted matrix Concept 2 toothbrush comes out to be final concept which would be developed.

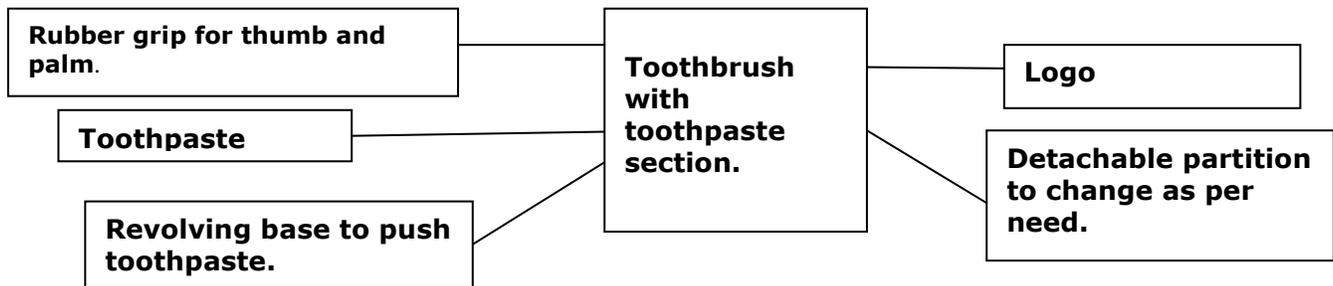


7. Embodiment Design

Embodiment design activity involves finalizing the product architecture, determining the form or shape of parts that will satisfy the required functions, and quantifying the important design parameters.

Product Architecture

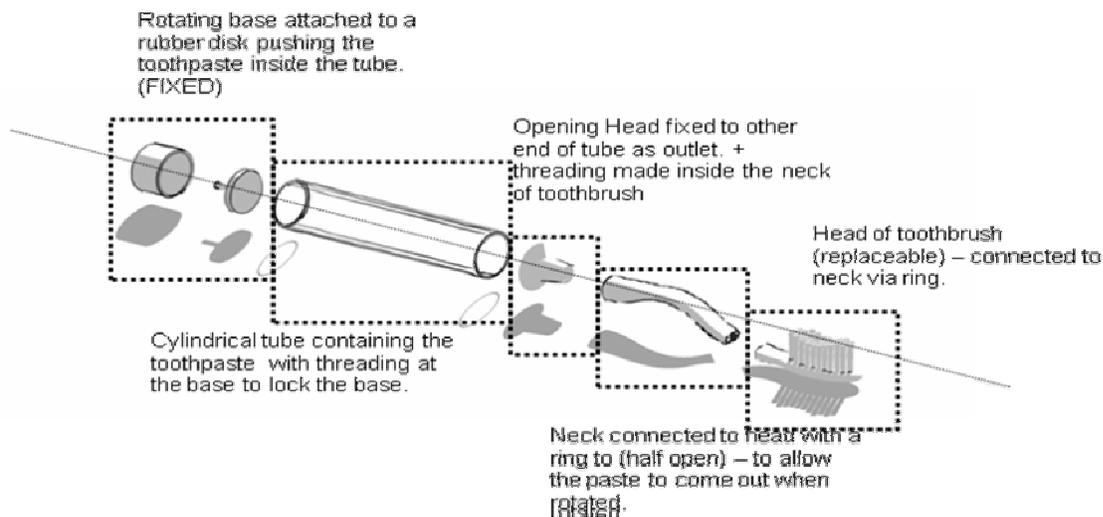
The concept has a very simple architecture. It has 3 major modules viz. toothbrush head, toothbrush neck, toothbrush paste compartment to keep toothpaste.



Configuration Design:

In configuration design we sketch out the standard parts, special purpose parts and parts to be manufactured. Also how these parts assemble or interact with each other functionally and physically. This can be shown by an exploded view.

Also we decide the materials for the parts and components.



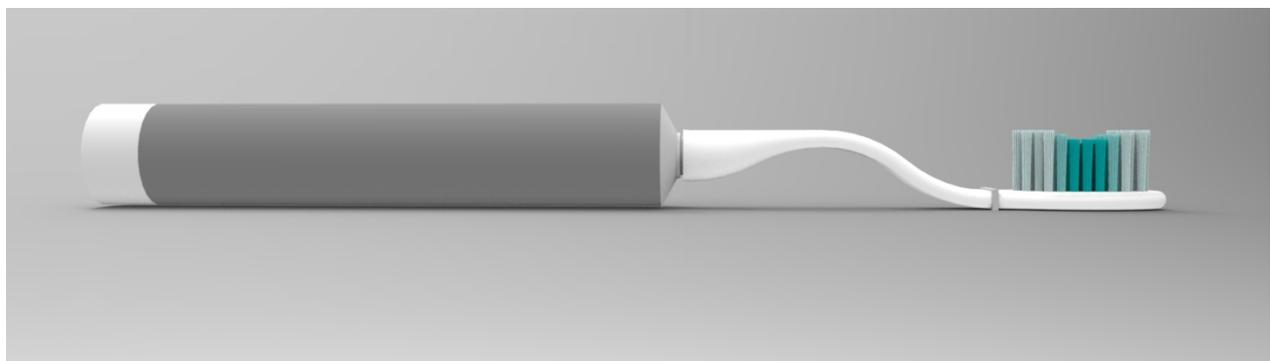
The basic material can be of hard plastic or bamboo.

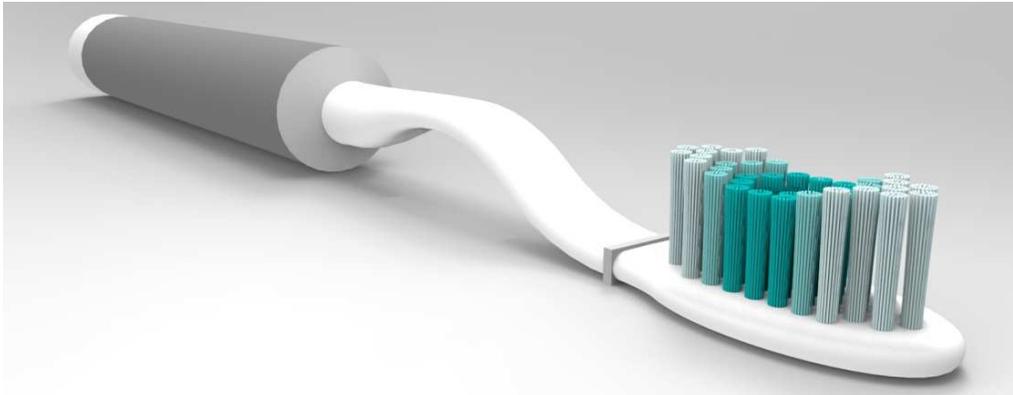
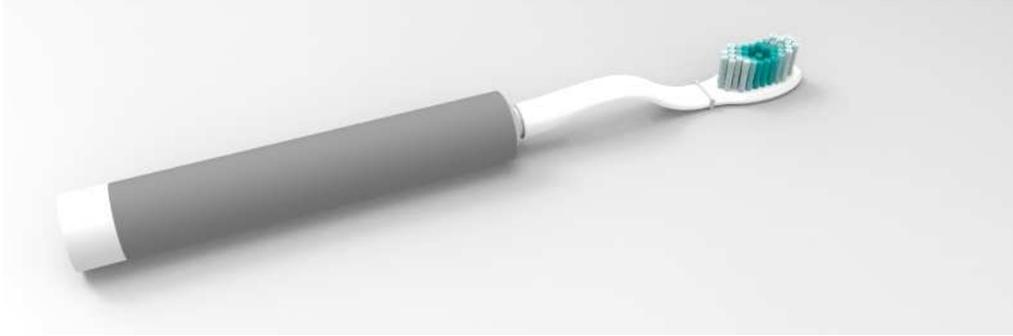
Parametric Design:

In parametric design the exact dimensions and tolerances are set. This helps in maximizing quality and minimizing cost. In this tradeoff between cost and quality (thermal insulation, appearance), form and weight, ease of handling and dimension constraints has to be achieved.

Part or components of the product	Parameter to be consider	Value and unit
Tooth brush head (with bristles)	Size length Breadth Height or thickness Bristles length	3 cm 1.4 cm .5 cm 1 cm
Toothbrush neck	Length Thickness	4 cm 1 cm
Circular ring connected to neck or toothbrush for revolving motion of head.	Outer diameter Inner diameter	1.4 cm 1 cm
Cylindrical tube to store toothpaste	Outer diameter Inner diameter	1.5 cm 1.3 cm
Circular base with revolving head	Outer diameter	1.6 cm
Cylindrical tube	Length	8 cm
Threading inside the toothpaste neck		
Total weight	Weight in grams	15 grams
Logo for authentication identification	Shape of logo	Circular

Prototype





8. Conclusion

The design concept developed of eco friendly toothbrush would benefit an individual and solves problem of excess of plastic dumping, portability, personalizing the product and modularity.

Every individual has to use and experiment with the new design with open mind keeping aside old traditional tooth brushes.

This would also create awareness among every individual about environment. The only disadvantage would be it would be costlier than current toothbrushes but the reusability makes it equally or in fact cheaper. The cost is worth enough if considered its features and usability. The same design can be used with various designer toothbrushes head and color.



Vipin Yadav



Surjeesh Laishram is pursuing his masters in design from Indian Institute of Information Technology, Design and Manufacturing Jabalpur. He is passionate about sustainable design approach, be it for designing a system or a product. He is also passionate about motorcycles and keeps on experimenting with motorcycles. He has more than two years of experience in apparel and accessories industry as a leather goods designer. He holds degree of B.Des (Leather Design) from NIFT New Delhi.



About the Lencil

SurjeeshLaishram

Today, around 15-20 billion pencils are manufactured globally every year. To make these pencils numerous trees are cut, which harm the ecological balance. Currently 20 acres of rainforest and 40 species of animals are killed every minute just to make pencils. Innovated in 1560, pencil is one of the design which has hardly changed fundamentally over the period of time. Even, numerous other technical designs of writing instruments could not replace pencils because of its simple and complete design. But, it also consume our precious forest work to visible adverse effects.

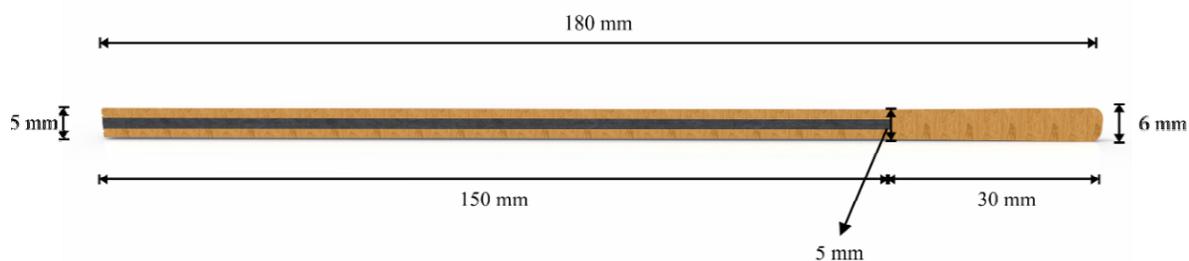
We have identified a noxious weed "lantana", abundant in South Asia, Southern Africa and Australia which can replace the red wood used in pencil without affecting its remarkable complete design. We also have developed a process to straighten the curved lantana sticks. Moreover, the pencils made of lantana is comparatively lighter and therefore comfortable to use for kids. The design is also optimized for reducing unused graphite lead.

Lantana weed grows fast enough to fulfill the growing demands and that too without any human efforts. It is estimated that, four sq. ft. in open field can generate wood for 15-20 pencils every 3-3/2 months. An optimized collection system if developed, can optimize the cost of collection of lantana stick along with generating employment for local workforce.

To attain the attention of the user to this new pencil, its aesthetics are kept as close as possible to the existing one. This way it will be easy to place our pencil in the market without changing buying behavior of the existing pencil.

Details of the Lencil

The dimension of the pencil is determined as per the need of the user. Objective is to make pencil aesthetically pleasing and similar to existing pencil, so shape is defined to hexagon. In this case the lead is not inserted throughout the pencil; it is inserted to some extent to save the graphite which is not used.



Length of the pencil is fixed at 180mm, in which we will have 150mm long lead and 30mm extension of wood. Diameter of the pencil is 5mm and it is continued till the end of the lead inside. After this position outer body of the pencil is tapered to 6mm. This is done to make it not able to sharp the pencil beyond that point. Hole inside the body of the pencil can be fixed according to the diameter of the lead to be inserted. In this case it is 2mm, with 0.2mm allowance for sawdust & glue mixture.

Results and Conclusion

Final outcome of the project satisfies the objective of the project. The Lencil is lighter than the existing pencils and it is easier to sharp. Procuring of the raw material is not difficult as it is easily available. It also saves the graphite from being wasted; it provides the full utilization of the product.



SurjeeshLaishram



Sachin Pisharody is a student of Masters of Design at PDPM Indian Institute of Information Technology, Design and Manufacturing, Jabalpur. He has done his Bachelors in Mechanical Engineering from the University of Mumbai. He has an orientation towards industrial design including product service design. His belief is in identifying the problems of the general masses and work for their benefits.

Safety Ramp for high Elevation Construction Works

Sachin Pisharody

1. Abstract

Safety of the labourers and workers is a factor which has been neglected in the past. Today investors and owners have understood that it is feasible to provide safety equipment to the workers rather than incur cost in later stages due to insurance or incentives which are to be distributed once major loss takes place. Firms have started providing necessary safety equipment among the workers to this effect. A fact they forgot to consider is that they are also supposed to provide an environment where these equipment could be put to use. A common problem was identified among the labourers/ painters was with the platform/ ramp that they use for the above mentioned activities. Even though the equipment have been provided to them they cannot use them because the ramp basically consists of a rectangular frame made by joining (welding) many iron rods. The idea of this project was to come up with something which may help them tackle the problem to some extent keeping in mind the money constraints and the ease of use for the unskilled labourers.

2. Introduction

A problem was identified with the way the workers involved in exterior building construction handled the material during their job. This problem was also seen common with painters and building repair workers. The problem was narrowed down to the platforms that the workers use as a base when working on scaffoldings. Neither are they forced to use the safety equipment nor are they that serious about the need of such equipment. The idea was to generate such a product that can be used on the current scaffolding system along with room for adjustments and also improve the safety of the labourers encouraging them to work more efficiently.

3. Objective

Since it was observed that the workers are not interested in using the equipment provided to them, safety must be ensured from our side. The product designed must not interfere with their way of

working and also not reduce their comfort zone. Aim is to improve confidence of workers when they are working at great heights and motivate them to work efficiently. They must be compelled to use safety belts and safety shoes through awareness. The design of the product should be such that it synchronises with other safety equipment. The device must be usable even to the most unskilled labour, considerably cheap in cost and steady when being used.

Mission statement: *To design a product that would help the labourers working at higher levels above the ground for their safety and efficient working.*

4. Problem Identification

Personal observation and recording of individual working in his workplace was done.

Venue: *Construction site of PDPM Indian Institute of Information Technology, Design and Manufacturing, Jabalpur.*

People interviewed: *17 labourers, all men and 1 site engineer.*



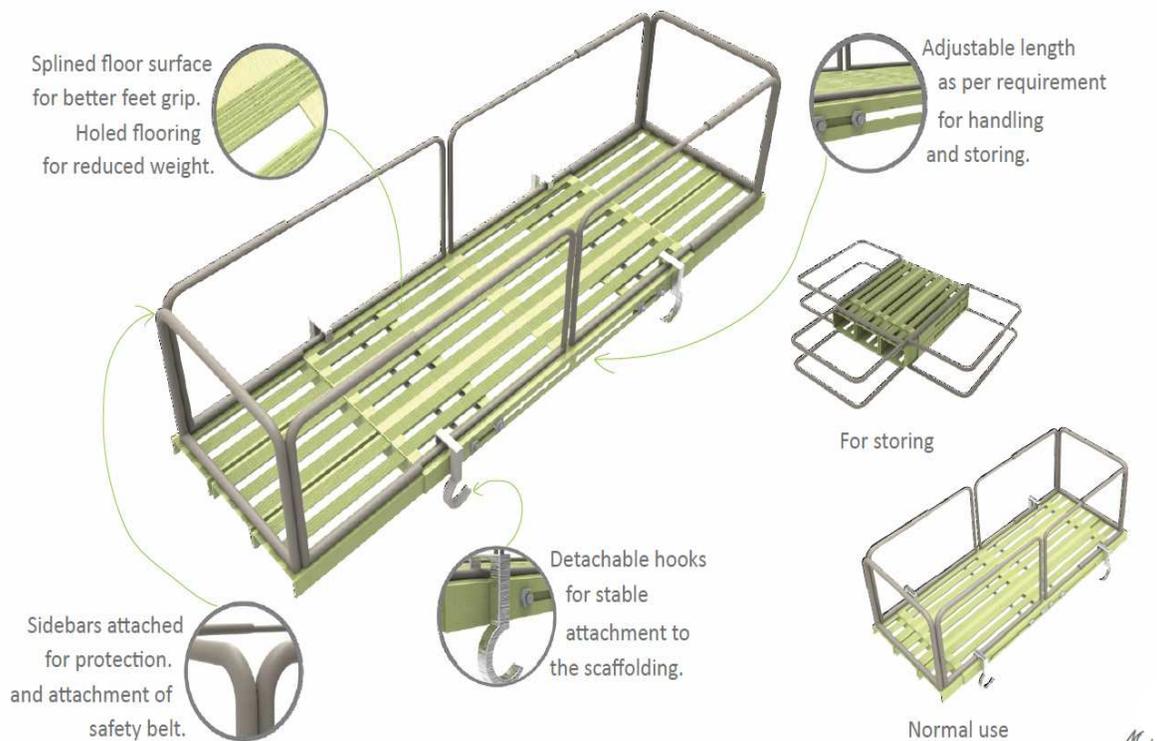
5. Observations

- ***Safety equipment provided include gloves, helmets, safety belts, safety shoes but rarely used due to discomfort on the existing platform and the scaffolding.***

- ***It is tough to climb the scaffolding up and down empty handed. Carrying tools and materials up the ladder an even more strenuous task.***
- ***Ropes used to lower empty buckets and to lift newly filled buckets.***
- ***Workers stand on platforms, made of iron rods, when they are working. Two individuals can stand at a time.***
- ***Transporting these platforms from one height to another is very hard as it weighs a lot. The task needs two persons.***
- ***The platform is unstable due to irregular placing on the scaffolding.***
- ***Worker fails to use entire platform because of fear for his life.***

No provisions for the safety of the workers. Sometimes workers have to stand on edge and extend their arms to reach some points on the wall which is very risky and can be fatal.

6. Proposed Solution



The product attributes targeted were:

- 1. Easy to use.**
- 2. Light weight.**
- 3. Safe.**
- 4. Robust.**
- 5. Adjustable.**
- 6. Easy to produce.**
- 7. Resistant to damage.**
- 8. Stable.**
- 9. Easy to store.**
- 10. Assists in refilling.**
- 11. Space.**
- 12. Cheap cost.**

7.Detail Design

The material for the base is FRP and the support bars are made of hardened plastic. The plastic version was selected to reduce the weight of the entire platform keeping in mind the constraints of cost and mass manufacturing. The hooks are designed in such a way that the platform remains affixed to the scaffolding even in times of shift of weight. The hooks are removable when the platform is to be removed. The support bars are held together using S-clamps which are removable and the entire structure can be folded for storage or transportation.

Prototyping

A basic prototype was made to check the mechanism of the design using conduit pipes for the support bars and ply for the base.



8. Conclusion

The platform is designed for use on scaffoldings, which are mainly used in India during exterior building works. The design is appropriate from the safety point of view and is also extendable. Nowadays, rope supported platforms are widely used for cleaning window panes and also some building exterior works. There is scope to incorporate the two designs in such a way that extension is possible in the rope supported platforms also.

Advances in technology and material science would also boost the design to form an even more robust design. Various safety equipment are available in market, but workers need to be taught about the benefits of these equipment. Environment must be such that they are able to use these safety equipment to the full extent. Lives are precious any improvement in the above design to come up with better solutions are welcome and must be encouraged.



Sachin Pisharody



Rupa Rai is pursuing her masters in design from Indian Institute of Information Technology, Design and Manufacturing Jabalpur. She is passionate about Barrier free environment and products. She is also into animation and visual domain. She has one year of experience in Architecture and interior domain. Rupa has strong foundation and experience in design research and user study which enables her to develop efficient product. She holds B.Des (Interiors) from APEEJAY Institute of Design, New Delhi.

Portable Luggage Carrying Design Solution for Indian Coolies (Porters)

RupaRai

1. Abstract

Railway has become a place where technology, industry, science, art and design are flourishing. As most of us would recall of our train journeys, it is a familiar figure people in red and white that sees us off and receives us after a long and tiring journey. They are the one on whose head and shoulders rest our bags and luggage, while we walk from one platform to another. Following us up and down from staircase to over-bridges with 8-10kgs of weight on their head and shoulders, it is definitely not an easy task for RAILWAY COOLIES or PORTERS.

Since, the commencement of Indian Railways, they have been serving the train passenger instead the safety of coolies while carrying heavy luggage has been fully ignored by the Government. The Government has provided medical facilities to these coolies but only if they got injured during working hours.

This group of workers i.e. Indian Coolies or Porters, literally thrives on our loads, making a living out of hard physical labor. They have to carry heavy luggage either on their head or shoulders. They have to walk on the staircases and ramps to reach from one platform to another with heavy weight on their body. Due to this, they face major back pain, shoulder dislocation and joint pains in different parts of body. Till now, there is no such designed instrument to help them while lifting and carrying luggage from one place to another.

The idea of this project is to come up with some design solution for coolies which help them in lifting and carrying the heavy luggage and reduce the chances of injuries and pains in their body to some extent.

2. Introduction

Being a creative is always like being a blind. We are dealing with the problem which we cannot see. We talk about it, we look at it and then we try to solve it by understanding only the parts we can see. Either by choice or by circumstances we need to come up with new solution that is called INNOVATION, coming up with a new approach to a problem.

The first priority while designing a product is identifying the customer needs with engineering constraints. Through engineering principles, concepts are generated keeping the customer needs into the mind, evaluation and selection of concept is done based on all the tradeoffs. Prototype is made on the selected concept before that this concept has to go through embodiment design phase where the precise dimensions are allotted and visualization of final product is done. The entire process involves multiple iterations. Any step can be repeated many number of times. The end result is the "Satisfactory of Customer".

The idea is to create a product which can help Indian Coolies or Porters while carrying heavy luggage from one place to another and help them to prevent themselves from body pain to some extent.

3. Objective

The aim of this project is to design and fabricate a tangible solution for Indian Coolies/ Porters while lifting and carrying number of luggage from one place to another.

The aim is to prevent them from major injuries while travelling from staircase to over-bridge and ramps. This project will also focus on designing of such product which help to improve the health of coolies like back pain, shoulder dislocation and other body pains so that they can work for longer period of their life.

4. Mission Statement

To design a product that would help the Indian Coolies/Porter in lifting and carrying luggage from one platform to another while considering their safety and health.

The main focus would be providing a tangible design solution to the Indian coolies/porters so they can travel easily and safely from one destination to another with 8-10kgs of loads on their body. The design of product would be like that so that it will combine with other safety majors.

The product could be use by any literate/illiterate coolie. This will cost less to Government as it would be economical. It would be portable and easy to carry along with them.

As this product would be a new of its type, it would be a brand new innovative design solution in this field. Since the inception of Indian Railways, coolies are serving train passengers but still there are no such equipment are provided from Government or any other NGOs to them to help them during work hours.

This product would be widely acceptable and must gain a good market share around 50-60% within a year of its launch. Government and NGOs will be the primary markets. Coolies don't have to buy by itself as Government can provide them with allotment of their uniform.

5. Literature Survey

As no work has been done regarding the safety of coolies, there are limited information about them.

Coolies are serving to us almost at every station in Indian railways. Although they have been serving the train passenger ever since commence of Indian Railway, licensed porters even today are not railway employees.

Earlier coolies used to carry luggage on the shoulders by using wooden stick.

6. Need Statement

To design a portable, light weight product which will help coolies/porters while carrying and lifting baggage on staircase, ramps and over-bridge. It will also help in reducing the occupational hazards.

7. Product Specification

The basis task of this product would be to prevent coolies/porters from occupational hazards such as back pain, shoulder dislocation and all other pains in the body.

As the weight of the luggage would be mostly around 8-10kgs, the weight of the product would be less. So, for the product canes of 40mm diameter would be used and for holding and supporting baggage resin fabric cloths would be there. The length of the product would be around 3'- 3'6". The length could be alter by changing the length of the straps according to the height and comfort of the carrier.

The product would be easy to wear and easy to remove. After use, the person can easily fold it and can hang it on his shoulders. The stacking is also so easy, just have to place it side-by-side.

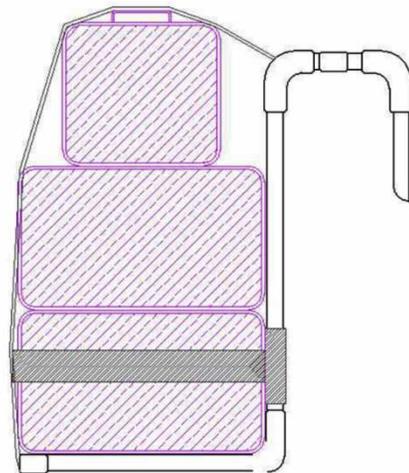
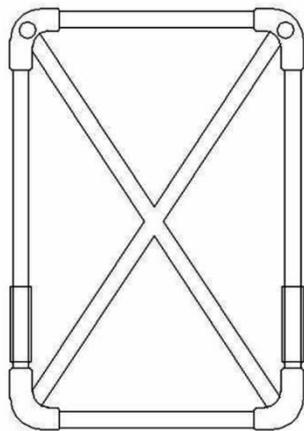
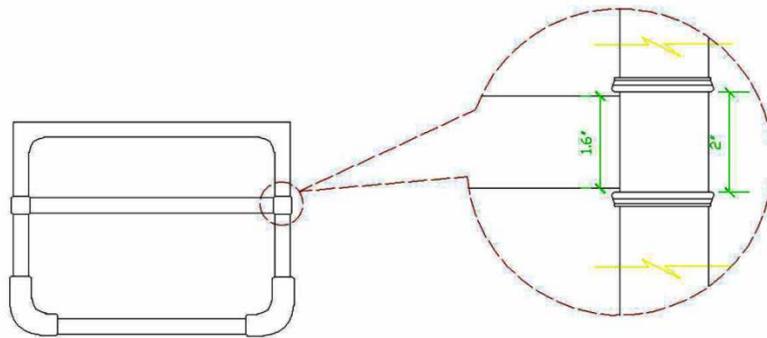
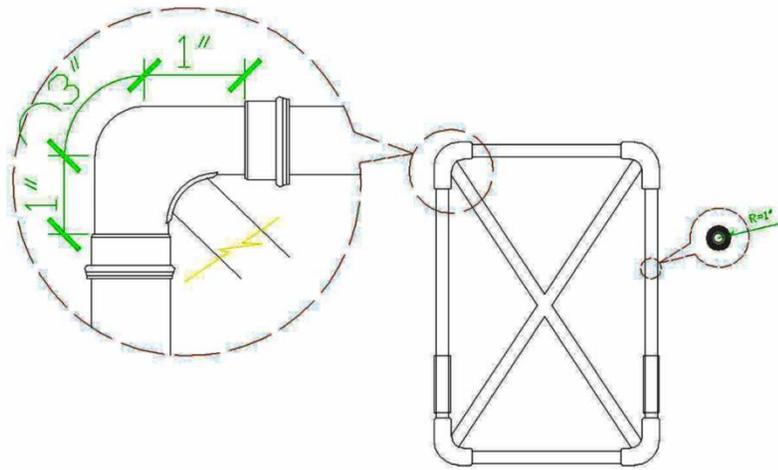
8. Concept, Selection& Evaluation

a) Concept-1

This concept was made keeping in mind that coolies don't have to carry luggage on their body. so, I designed a trolley to keep all the luggage on the trolley and coolie has to push it from backside.

The good thing is that, coolie can easily travel through ramp to another platform.

The problem with this concept is that, this cannot travel on the staircase.



Bill of Materials

ITEM NO.	PART NAME	DESCRIPTION	QTY.
1.	Base Rod 1	PVC Pipe 60mm dia.	1
2.	Base Rod 2	PVC Pipe 60mm dia.	1
3.	Base Rod 3	PVC Pipe 60mm dia.	1
4.	Side Rod 1	PVC Pipe 60mm dia.	1
5.	Side Rod 2	PVC Pipe 60mm dia.	1
6.	L - Angle	PVC	6
7.	I - Angle	PVC	4
8.	Paint	Asian Enamel	200ml
9.	Belt	Nylon Thread	10mtr.
10.	Locks	Plastic	3pi.

Prototyping



9. Result and Conclusion

The designed frame is made for Indian Coolies or Porters. The new designed frame is light weight and coolies can carry it with them. Coolie can carry all the luggage easily and a belt is provided for holding all the luggage. The grip on the hand rod will help him to carry the weight more efficiently.

Coolies can walk on the staircase without any problem.



RupaRai



Ravindra Singh is an extremely motivated design researcher and Industrial designer. He is passionate about universal design; designing a product for extensive variety of user's. As a researcher at IIITDM Jabalpur, Ravindra Singh built skills of user centric design, universal design that allows him to understand the user's insights. Ravindra Singh has solid foundation and experience in Design research enables him to design effective and efficient products and services. He has 5+ years of experience working as Teaching Assistant at IIITDM Jabalpur in design domain. He holds Master of Design(M.Des) and B.Tech in Mechanical Engineering.

Q-quack workstation

Ravindra Singh

There are dentist in India who have their office set up on the walkway or under tree. It is very much practiced in certain part of rural as well as urban areas in India and having large patient pool as well. They do not have any qualification or degree and uses very crude devices for doing this task, still many people visiting them because they do not afford fees of a regular dentist

Need statement

To design low cost & ergonomically designed workstation for the quacks working under the tree or roadside to make their job easier and safer for both set of users (quacks & patient)

Target audience

Quacks (untrained person who pretends to be a physician) and patients

Design Challenges associated with the problem

There are few challenges regarding the workstation for quacks.

- 1. The overall design of the workstation, how it can be accessible for both set of users.***
- 2. How it will provide ease of use to dentist.***
- 3. What kind of benefit it provides to quacks and patients.***

The design of workstation on such a way that the dentist does not required any training for that, it should provide the usability, accessibility and functionality to the users. It also required portability and mobility.

Product attributes:

Attributes and value associated with the product are selected based on user research, are listed below:

- 1. Acceptance**
- 2. Flexibility**
- 3. Attractive**
- 4. Low cost**
- 5. Comfort**
- 6. Reliability**
- 7. Affordability**
- 8. Product attachment**

Research Approach

Direct observation

Roadside dentist usually open their open-air clinic under the tree. These roadside dentists open-air clinic consists of nothing more than a blue plastic sheet, which is the dentist's chair, a big bag full of bottles, syringes, cement for filling etc. as shown in figure 1.



Figure 1: Direct observation

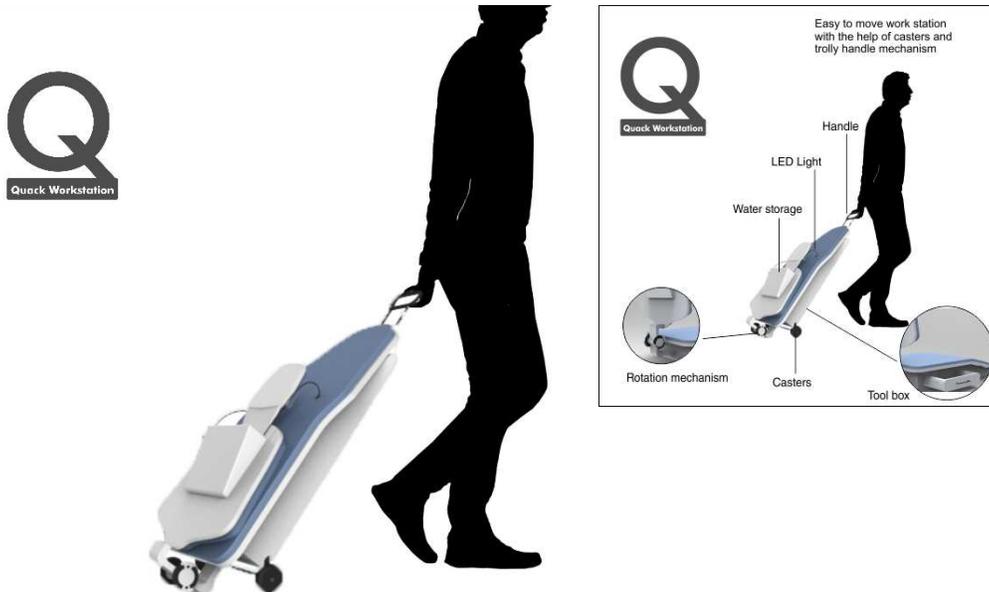
Task analysis:

- 1. Placing tools under the tree or roadside.**
- 2. Wait for the patients.**
- 3. Patients sits on the stool**
- 4. Performing task (Operating the patients)**

After direct observation and task analysis it was found that there are issues with the current practice. There is no proper workstation or sitting place for both users, tools are lying on road, while closing the shop they do not have proper or safe storage for tools etc.

Solution

Ergonomically designed workstation for rural dentist working under the tree. It has adjustable backrest as per the requirement, lamp and water pipe attached with this workstation for dentist and patients respectively. It has storage also for the dentist equipment's i.e. facemask, glove, air spray, tools etc.



Conclusion:

Q-quack workstation is a concept and requires more research on the manufacturing process and material. As compared to existing practice, it will surely help to the dentist and patients. Q-quack workstation is very simple and attractive and it provides both

tangible and intangible benefits to the users. The focus of this project is to provide safe and comfort feature to both segment of the people.



Ravindra Singh



Madhura Phadke is a Product Designer from MIT Institute of Design. Currently doing her Masters of Design from Indian Institute of Information Technology, Design and Manufacturing, Jabalpur. Her field of interest is Medical Product Design and Frugal Innovation During her bachelors she did couple of projects in healthcare domain and Design for Special Needs. It evolved her interest to further work upon Medical Product Design. Madhura has won scholarship twice in MIT. By passion she is Bharatnatyam Dancer (Alankar)

Frugal Design of Medicine Tablet Strip

Madhura Phadke

Abstract

Medical waste is all waste materials generated at health care facilities, such as hospitals, clinics, physician's offices, dental practices, blood banks, and veterinary hospitals/clinics, as well as medical research facilities and laboratories

The project mainly focuses on reuse of used or expired medicine tablet strips without recycling or processing

Introduction

The Medical Waste tracking Act of 1988 defines medical waste as "any solid waste that is generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biological." This definition includes, but is not limited to:

- ***blood-soaked bandages***
- ***culture dishes and other glassware***
- ***discarded surgical gloves***
- ***discarded surgical instruments***
- ***discarded needles used to give shots or draw blood (e.g., medical sharps, tablet strips)***
- ***cultures, stocks, swabs used to inoculate cultures***
- ***removed body organs (e.g., tonsils, appendices, limbs)***
- ***discarded lancets***



Medicine tablet strip is the most commonly used element



Ref:<http://www.alwasat.ly/ar/news/libya/11639/> Ref:
<http://www.dreamstime.com/photos-images/tablet-strips.html>

Literature Survey

Characteristics of medical strip packaging:

In current scenario two types of packaging are available Aluminum foil pack and Blister packaging with Aluminum sealing



Aluminum foil pack



Blister Pack

Testing of material:

To test packaging materials following *Critical parameters are performed* during screening

- *Release of chemicals from components of packaging material*
- *Release of visible and /or sub-visible particles*
- *Adsorption or absorption of pharmaceutical*
- *Chemical reaction between pharmaceutical product and packaging material*
- *Degradation of packaging component in contact with pharmaceutical products*

- ***Influence of manufacturing process on the container***

Tests performed during initial phase

- ***QC test***
- ***QC Plus***
- ***Pack integrity***

Functions of packaging:

Containment

Often blister *strips* are stored away from their outer wrapping or *packaging* that contains the information about how to use the *medicine* safely

To avoid following problems:

Not to leak, nor allow diffusion and permeation

Strong enough to hold the contents during handling

Protection

As medicines may get contaminated. Protection from following factors is must when dealing with medicine strips:

- ***Light***
- ***Moisture***
- ***Oxygen***
- ***Biological contamination***
- ***Mechanical damage***
- ***Counterfeiting***

Material characteristics

The material used must preserve the physical properties of all dosage forms and protect them against damage or breakage. It must preserve the characteristics properties of the product to comply specifications

Selection of packaging material is based upon following features

- ***Moisture barrier requirements***
- ***Light barrier requirements***
- ***Gas barrier requirements***
- ***Chemical properties***

What happens to Medical waste in India?

In India, the Bio-medical Waste (Management and Handling) Rules, 1998 and further amendments were passed for the regulation of bio-medical waste management. Each state's Pollution Control Board or Pollution control Committee will be responsible for implementing the new legislation.

In India, there are a number of different disposal methods, yet most are harmful rather than helpful. If body fluids are present, the material needs to be incinerated or put into an autoclave. Although this is the proper method, most medical facilities fail to follow the regulations. It is often found that biomedical waste is put into the ocean, where it eventually washes up on shore, or in landfills due to improper sorting when in the medical facility. Improper disposal can lead to many diseases in animals as well as humans. For example, animals, such as cows in Pondicherry, India, are consuming the infected waste and eventually, these infections can be transported to humans through eating of the meat.

Many studies took place in Gujarat, India regarding the knowledge of workers in facilities such as hospitals, nursing homes, or home health. It was found that 26% of doctors and 43% of paramedical staff were unaware of the risks related to biomedical wastes. After extensively looking at the different facilities, many were undeveloped in the area regarding biomedical waste. The rules and regulations in India work with The Bio-medical Waste (Management and Handling) Rules from 1998, yet a large number of health care facilities were found to be sorting the waste incorrectly. Worldwide, there are specific colored bags, bins and labels that are recommended for each type of waste. For example, syringes, needles and blood-soiled bandages should be all disposed of in a red colored bag or bin, where it will later be incinerated

Whole pharmaceuticals tablet production is divided into following sections

- *Returned stock***
- *Out-of-date stock***

- ***Damaged stock***

Returned stock: The Regulations are unclear on this issue and so the practice should draw up a standard operating procedure (SOP) to inform staff. The decision to accept returned medicines will vary on an individual basis and should include consideration of refunds, social responsibility for taking the medicine out of circulation, and the practice relationship with the client. It is permissible to reuse returned medicines provided the practice is sure that they have been stored according to their summary of product characteristics (SPC). Damaged or incorrectly stored medicines will need disposal and this will incur a cost if done at the practice; disposal by the client at home falls outside the Waste Regulations

Out-of-date stock: Out-of-date medicines should always be disposed of due to the inherent danger of using out-of-date stock. It is illegal to use out-of-date medicines. This category includes all injectable medicines, 28 days after the broaching of a multidose vial

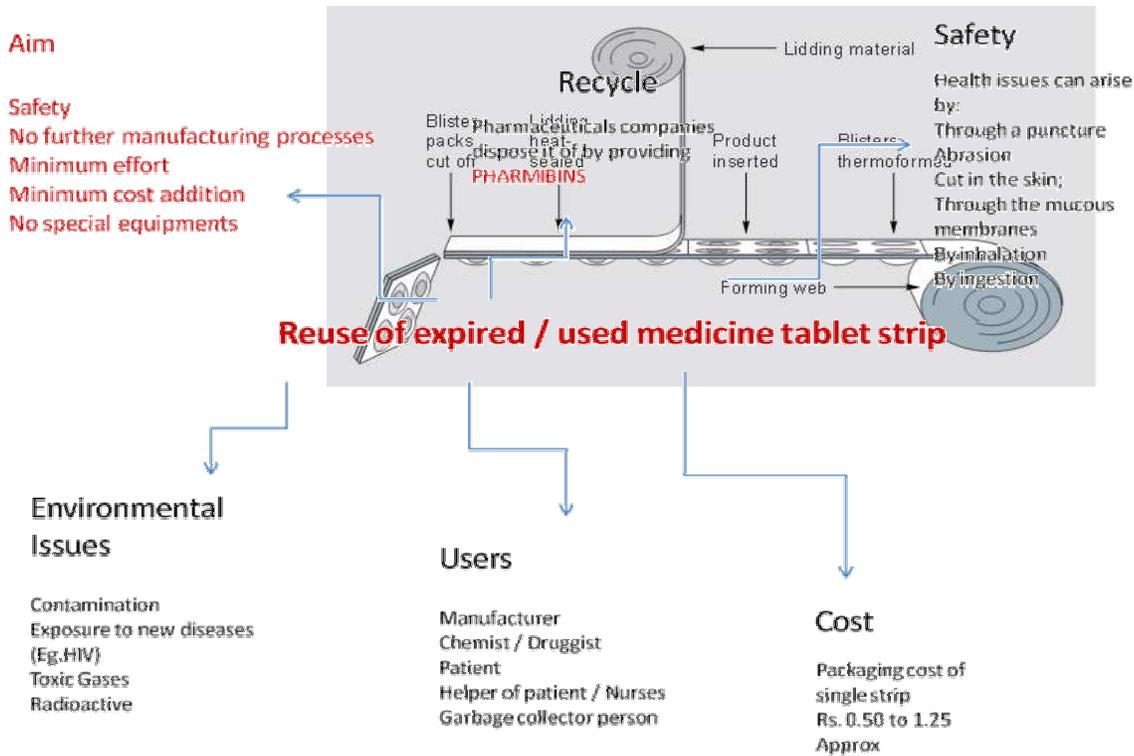
Damaged stock: Damaged stock includes any in-transit damages or spillages and breakages. For spilled drugs, the medicine should be contained with the practice 'spill kit' (sand, sawdust or cat litter), swept into a container, and the content and amount estimated and recorded. The container can then be disposed of into the pharmaceutical waste bin.

Need Statement

As mentioned in the abstract this project mainly focuses on reuse of used or expired medicine tablet strips (blister packed only). The information is collected from actual field and people involved in pharmaceutical industry and also users.

Further need statement has been emerged

To come up with a solution which is Frugal innovation in design .The final concept should not involve any further operational or manufacturing changes to medicine tablet strip and should be made with minimum cost addition.



Manufacturing Process

Blister Packaging

The primary component of a blister pack is a cavity or pocket made from a formable web, usually a thermoformed plastic. This usually has a backing of paperboard or a seal of aluminum foil or plastic. A blister that folds onto itself is often called a clamshell.

Characteristics :

- Protection from external factors (Humidity , Contamination etc)
- Protection against UV Rays

Material Analysis

Ref: <http://www.packagingconnections.com>

Table 1: Comparison of forming films.

Type and Thickness of Forming Film (mil)	WVTR (g/m ² /day)*	Price per Unit Area**
PVC (10)	1.1	1
PVC/PVDC (10/1.2)	0.17	2.1
PVC/CTFE (8/0.76)	0.07	2.1
PP (12)	0.20	1.3
PET (10)	2.6	1.4
PS (12)	6	1.2
OPA/aluminum/PVC (1/1.8/2.4)	0	2.9

*As measured on the unformed film at an ambient temperature of 20 °C and 85% RH.
 **Where 1 represents the price per unit area of 10-mil PVC.

Ref: <http://www.packagingconnections.com/>

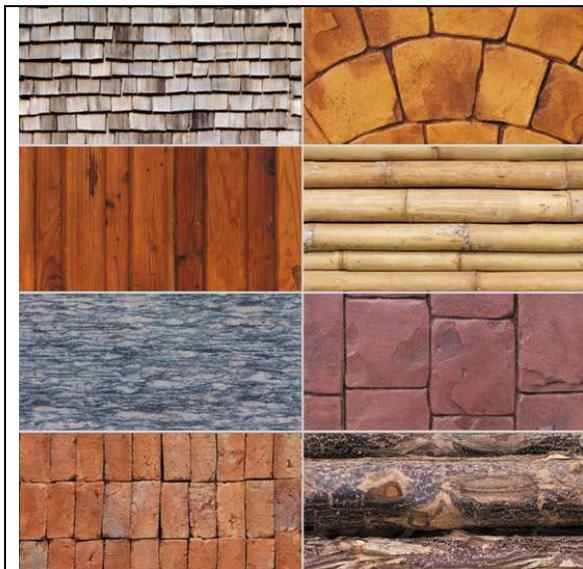
Mind Map Analysis

Identified Areas of Use

Construction

Building Material

Furniture



Structural reinforcement possibilities in construction materials





Sandwich Panel

Future Scope

Biodegradable Blister Film can be used to completely change scenario of medicine tablet strips

Education Requirement: *Not specific*

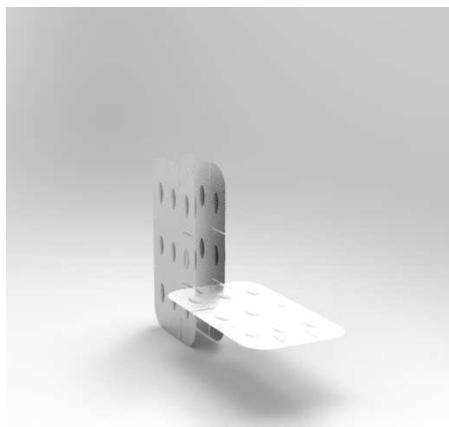
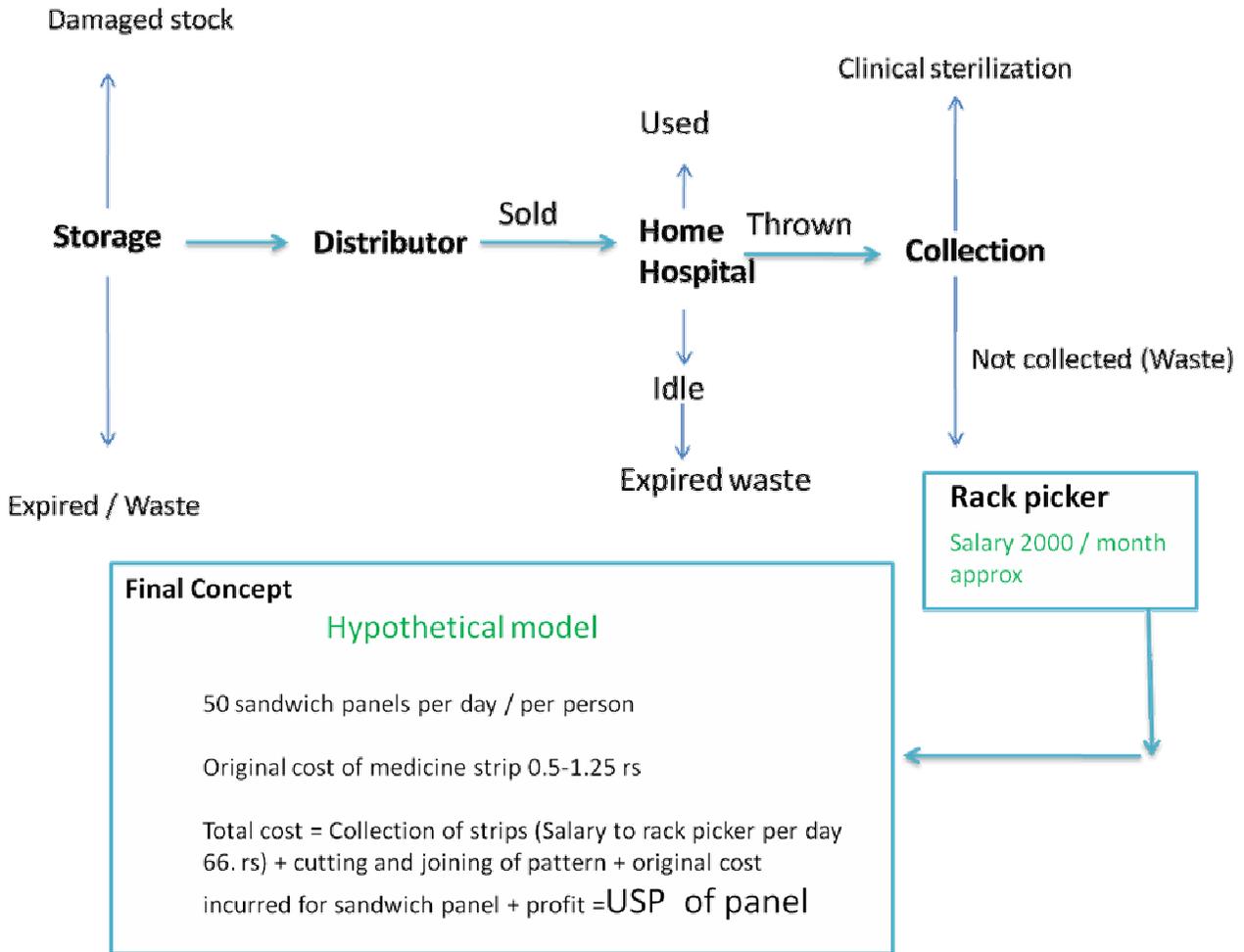
Tools: *Cutter, Industrial Glue*

Product Stages till manufacture

Detail Design

Variations in structure can differ from:

Height width and thickness of strip



Material: Blister Pack
Length: 100mm
Height: 70 mm



Material: Blister Packed medicine tablet strip

Slits are made into tablet strip to create structure of mesh. Further adhesive will be used to make joints stronger. Strips can be placed in many directions and patterns

Structure made for reinforcement in Sandwich panel



Madhura Phadkeis



Bevin Hector D'Cruz is doing his Masters in Design with specialization in interaction design. Worked on both technical and art field with UG degree in Technology (electronics and communication). Looking forward for research and work in User interaction, electronic product development and human computer interaction.

Other projects worked on interactive method in detecting track fault in railway, interactive web design for digital advertising, and interactive application mock ups and design after user research survey.

AUTOMATIC LIGHT

Bevin Hector D'Cruz

1. Abstract

Problem which was taken initially for the design project was "Visibility during a black out is very hard and the worst thing is that it's hard for us to find a light source in that situation "

From the problem questionnaire and interview was done with feedback from the users who face this issue daily and from that I have come up with a design. The circuit part of the design was completely electronic sensor based which was chosen from different variation and combinations of sensor circuits and switches.

For the aesthetic part, foam was chosen which can easily go with any structure like wall or table. And which can be easily modified to the desired shape. Chosen a color which will be eye pleasing and material has to be of sustainable design so wood is used. With the help of Lab equipment's, students, design Lab assistants was able to come into many conclusions and a simple display prototype.

2. Introduction

What is super light?

Super Light is a Motion Sensor Activated Dark sensor activated Led Light .It senses the amount of darkness in your area and turns the circuit on by itself and when a person comes near it will automatically turn the LED on. No need of switch or to have the trouble of finding the switch. No need of puncturing the wall to get it installed it works on dc powered cell and can be easily mounted on any wall outside or inside

How super light is useful?

Have you ever faced the problem of Visibility during a blackout? And the worst thing is that it's hard for us to find a light source in that situation .Even you feel like having a drink of water in the night don't feel like lighting up the light so it will disturb the other or you feel half of your sleep will go due to reaction of eye to those bright lights or even lazy to turn on the switch.

Super light don't have a switch. It will sense your motion and will light up giving you enough light to do your work. Just fit it under your bed to give enough light to help you out in the dark when you get up and stand. It will sense the movement and turn on

Even if the light goes off not because of power cut any issue this will be much useful than an emergency lamp it senses the dark and lights up with the help of motion

What is the technology?

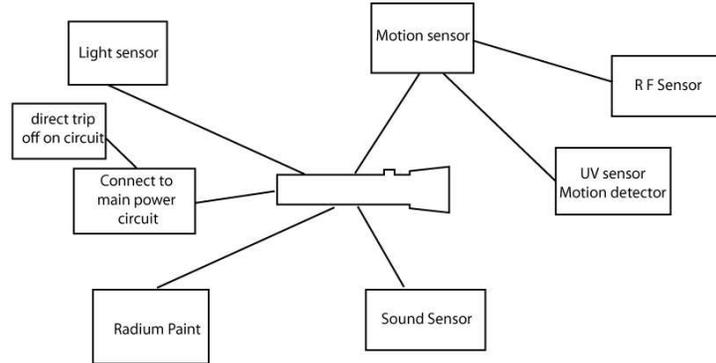
Super light Technology is mainly uses two types of sensors Dark Sensor and a Motion sensor. Dark sensor detects the intensity of light, checks the environment is dark so that it can light up. And Motion sensor detects the presence of the user. These act like two switches and control the operation of light.

3. Objective

"Visibility during a black out is very hard and the worst thing is that it's hard for us to find a light source in that situation" was the first problem statement that I have come across. Light is a fundamental element of life. We depend on it more than we can count on daily basis. Just see how much time we spend on a lighted room. Our eyes are not adapted like that of animals so that we can see in the dark. We are so dependent on light we feel scared of the dark. Lighting equipment's are in different forms are used for many purposes. I have concentrated mainly on interior lighting and ease of operation when it's hard to find the switch.

Also taking information from *LCR- Lighting Research Centre*, The Lighting Research Center is the world's leading university-based research and education organization devoted to lighting from technologies to applications and energy use, from design to health and vision. Lamps, fixtures, controls and their installation must be carefully designed to make the most of the light without wasting it. Among the many considerations for lighting design are energy use, human response, cost, how well the technologies work, and how easy they are to maintain.

Have taken lot of consideration of lighting systems and how it should work, where it is implemented and considering the limitation of manufacturing I have to come up with the design.



4. Need Statement

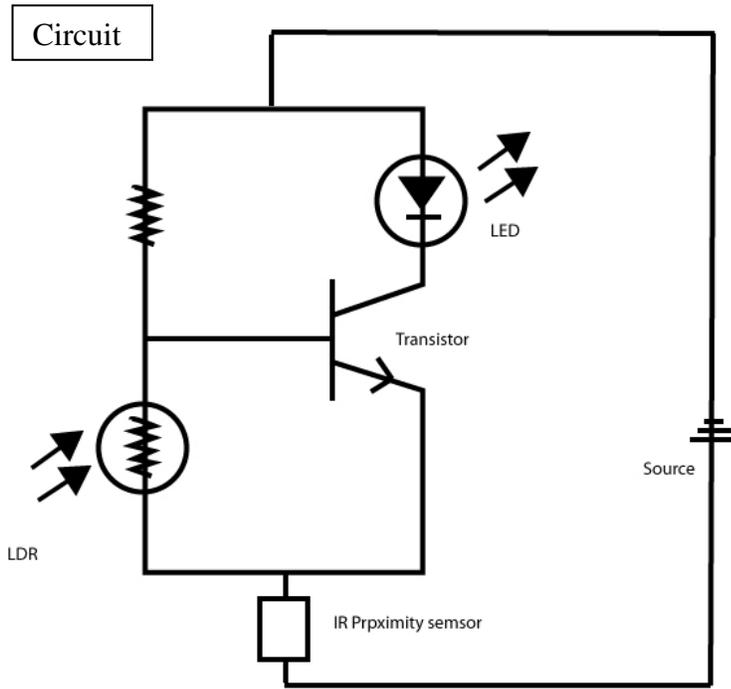
As said in the objective, the design has to be acceptable and simple. Taking the information regarding lights from LCR and Questionnaire fill up from users as well as the problem faced (customer dealing with black out) with the help of Google Docs .Tabulating the response of the answer given for each of the question regarding the problem and the product by the customer, need statement has been made.

To come up with a device that the customer can easily switch on or it will sense the customer that it will turn itself on and will turn off if there is other light source. The lamp or light should work only if it's dark and if visibility is less. Form should be pleasing, acceptable color and standards that can make it well suited with other common electronic equipment's in home and the latest interior design trends.

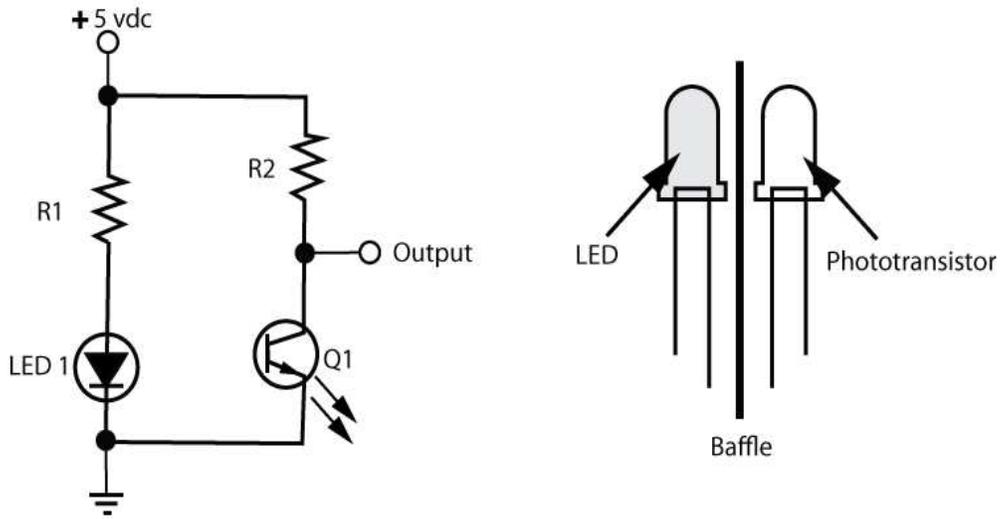
5. Product Concept and Specification

The lamp or light should work only if its dark and visibility is less. Form should be pleasing with color and standards that can make it well suited with other common electronic equipment's in home. It will be better if it give a modern trendy and works well with the new interior design products.

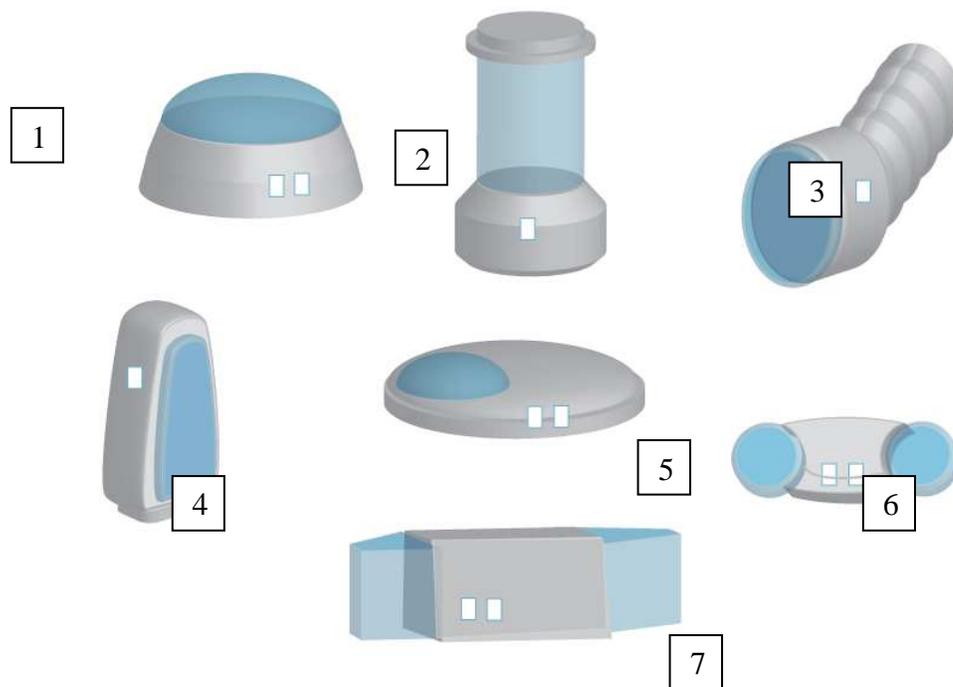
Abstraction



Circuit



Basic design of the infrared proximity sensor

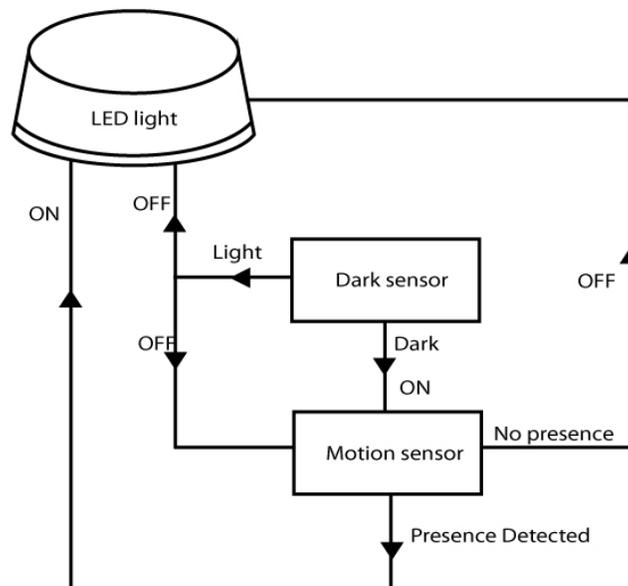


Algorithms/Computational Implementation

For Motion sensor- A Passive Infra-Red sensor (PIR sensor) is an electronic device which measures IR light radiating from objects in its field of view. Apparent motion is detected when an infrared source with one temperature, such as a human, passes in front of an infrared source with another temperature, such as a wall. All objects emit what is known as black body radiation. This energy is invisible to the human eye but can be detected by electronic devices designed for such a purpose. The term 'passive' in this instance means the PIR does not emit energy of any type but merely accepts incoming infrared radiation.

A person entering the monitored area is detected when the infrared energy emitted from the intruder's body is focused by a Fresnel lens or a mirror segment and overlaps a section on the chip which had previously been looking at some much cooler part of the protected area. That portion of the chip is now much warmer than when the intruder wasn't there. As the intruder moves, so does the hot spot on the surface of the chip. This moving hot spot causes the

electronics connected to the chip to de-energize the relay, operating its contacts, thereby activating the detection input on the alarm control panel. Conversely, if an intruder were to try to defeat PIR perhaps by holding some sort of thermal shield between himself and the PIR, a corresponding 'cold' spot



6. Concept Evaluation & Selection

Based on the customer need and factors involving shape of lamp that reflects more light few concepts are selected of interest. Also considering the manufacturing process with the available machine and material few concepts are considered as feasible

Concept evaluations based on Concept Scoring Method is done .Some weighing factors are used for rating them. Five point scale score is used as the knowledge about the criteria is not there in detailed and product is still in early development

Functionality	Concept 1	Concept 2	Concept 3	Concept 4	Concept 5	Concept 6	Concept 7
Aesthetics	5	3	4	3	2	3	2
Easy to hold	4	4	4	3	3	1	1
Light coverage	5	5	3	3	2	3	3
Manufacture ease	4	0	1	1	2	1	1
lay out for circuit	3	3	1	2	3	2	2
Space consumed	3	2	4	2	5	3	3
Cost	4	3	2	2	4	3	3
Total	28	20	19	16	21	16	15

According to functionality circuit is decided

	Concept 1	Concept 2	Concept 1 + 2
Detection			
Darkness	<input type="checkbox"/>		<input type="checkbox"/>
Motion		<input type="checkbox"/>	<input type="checkbox"/>

7. Embodiment Design

Function of a light is done and the new feature of no switch and sensor is shown in the representation diagram below



Child coming near a dark area and it lights up. Both dark sensor and motion sensor is under on condition

Taken the Final concept and taken some good features of the other concept added to the final chosen concept to make it better



Wood (MDF- Medium Density Fiber can be used) is use for making the body of the product with transparent lid made of plastic. The body will be coloured black with base wood and graphic of electronic circuit will be added later on the body in light green tint to make it aesthetically appealing as an electronic gadget

Dimension features

Main wooden body- the diameter is around 11 cm and base will be around 13 cm, the shape is such that it will be hollow inside to hold the circuit. The transparent lid of dome structure of appropriate diameter will be on top to let the LED powered light outside.

Ergonomics

For the light no particular dimension is needed, still hand dimension is considered for getting the grip in holding the body of the lamp light, which will be around 7cm

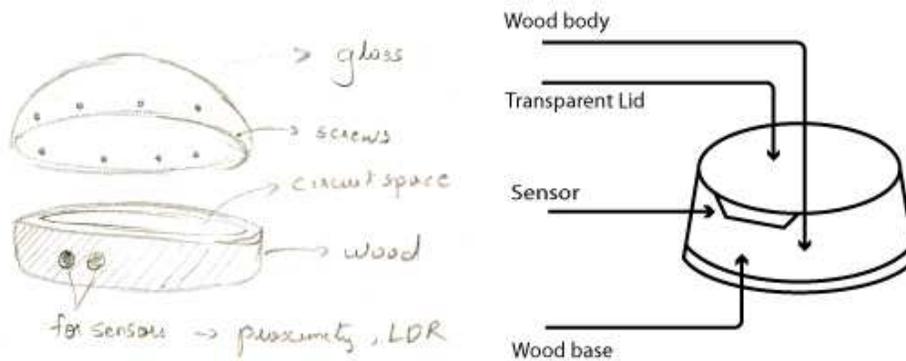
Material chosen: wood

Wood is used as it follows the latest interior design done in homes and will be aesthetically appealing. Compressed and artificial wood like material can be used

Why wood?

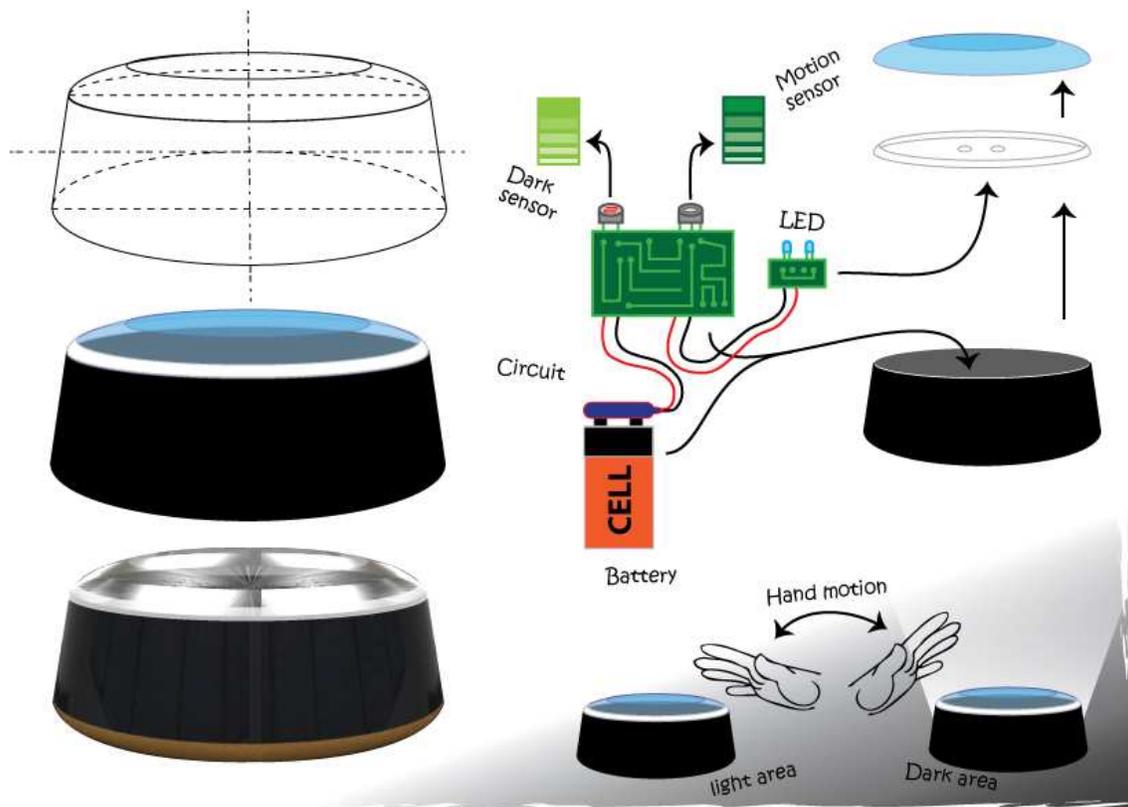
- ***Bad conductor***
- ***Aesthetically appealing***
- ***Easy to carve out into better shapes***

Early Material related sketches



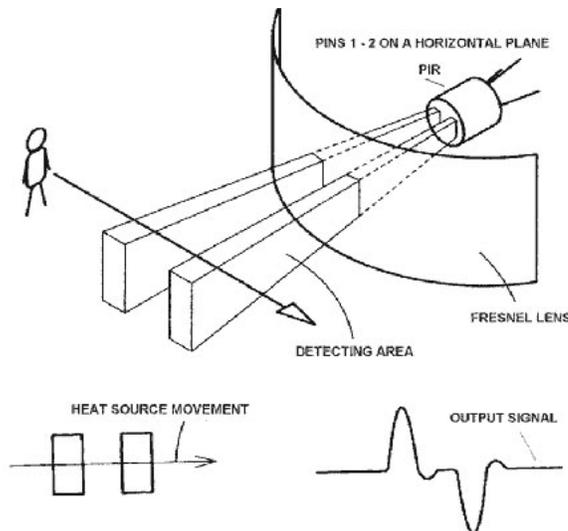
Prototype





8. Results

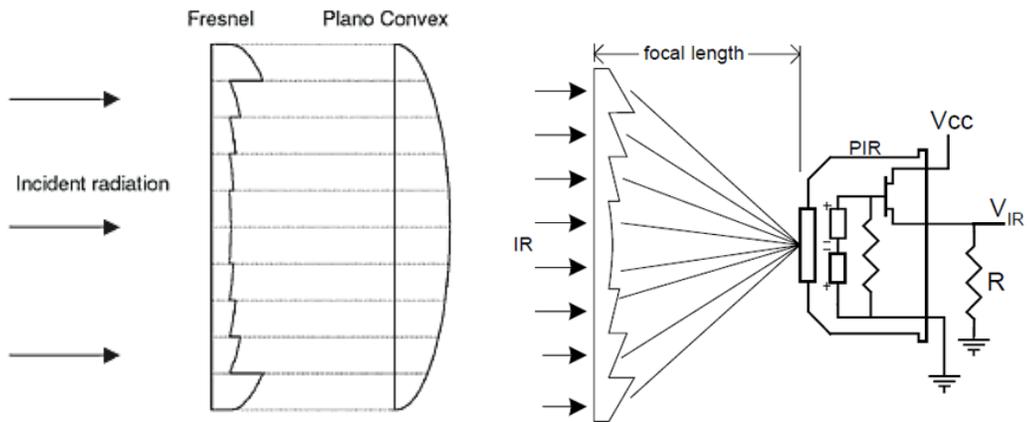
- **PIR motion sensor has a Field of View or 130degree**
- **Range inside 1 meter**



- **Response of LDR is active. Darkness of room is detected fast and circuit stops working**
- **PIR detects also fast and turns on light when it's dark**
- **Response off time is about 15 to 20 seconds, light will go off when there is no presence**
- **Shape and body easy to handle**
- **Calculation of power consumption can approximately add the fact that it will last for 3000 hrs**
- **Intensity of light with shape, thickness and material of the plastic lid says light will be covering about 2 to 4 meter**
- **Luminous efficacy of 18–22 lumens per watt**

9. Conclusions

- **Uses other than as emergency lamp in places like cabinet, bedroom, as pet light, stair ways, walk ways, trunk of vehicles**
- **Use of Fresnel lenses to make the PIR more sensitive and also it acts as a protective covering as the lens glass can be affected by scratch and stop working. Also Fresnel lens helps in concentrating the incident radiation into a particular point like the center where the PIR can be placed and the sensitivity of the sensor can be utilized completely with a good range of coverage**



Reference

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Bevin Hector D'Cruz



Ganesh S is student of M.Des program at Indian Institute of Information Technology, Design and Manufacturing, Jabalpur, India. He is Teaching Assistant for various Bachelors program at the university. He has completed his Bachelors in Civil Engineering under VTU, Belgaum. He holds IGNOU credits for Disaster management. He was intern under professors at IISc Bangalore where he was introduced to the world of Sustainable Architecture, He is particularly interested in sustainable design. His Dissertation work for Master's program is in the area of medical equipments, (preventive medicine). He is committed to help the vulnerable, lesser privileged and differently abled people. He believe passion is vital ingredient for success and want to be judged by individual performance and rewarded for his efforts based on ability to execute.

Design of Stove for Rural Masses of India

Ganesh S

1. Abstract

A majority of villagers usually cook on a two brick chulha (earthen burner), which over a period of time is responsible for lung disease and blurred vision. Loss of heat energy due to improper design of chulha /stove. Fire escapes from all the openings and it makes the cooking process very slow. Escape of heat energy must be trapped and channelized for maximum utilization. In existing solution work done is less with large amount of fuel (firewood) being consumed. Present days products does not accommodate the removal of ash in hassle free method. Fabrication of products are not precise and low fidelity techniques are adopted. This problem must be solved at the grass root level. Study of feasible raw material used, load bearing capacity of the model, must be made. Less material must be involved in setting up the chulha and must be easily portable when in time of need "Not only does it help many people living at very low income, it is also major step in developing rural masses of India".

2. Introduction

A cook stove is heated by burning wood, charcoal, animal dung or crop residue. Cook stoves are commonly used for cooking and heating food in developing countries.

Problem of cooking over an open fire is the increased health problems brought on from the smoke, particularly lung and eye ailments, but also birth defects. Replacing the traditional 3-rock cook stove with an improved one and venting the smoke out of the house through a chimney can dramatically improve a family's health.

Deforestation and erosion are often the end result of harvesting wood for cooking fuel. The main goal of most improved cooking stoves is to reduce the pressure placed on local forests by reducing the amount of wood the stoves consume. Additionally, the money a family spends on wood or charcoal translates into less money being available to be spent on food, education, and medical care; so an

improved cooking stove is seen as a way of boosting a family's income.

The cook stoves and the soot that arises from burning biomass – firewood, dung and agricultural residues – are now the focus of a global community fighting climate change as well. The soot – or black carbon – is a killer. It causes respiratory problems and leads to premature deaths. Women and children in poor households are the worst hit. The black carbon particles also contribute to global warming.

3. Objective

Main objectives are:

- i. Conservation of Fuel*
- ii. Provides smoke free hygienic cooking atmosphere*
- iii. Reduction in health hazards*
- iv. Reduction in cooking time*
- v. Easy disposal of ash*
- vi. Hot food box*

Design Interventions: Heat Energy which escapes due to improper design of chulha will be modified and focus will be to channelize this heat energy and derive maximum benefits. Ash disposal system, smokeless cooking and easy portability will be new novelties in this product design.

4. Literature review

Effect because of this issue are:

More firewood is consumed, time taking for preparation of food or heating water is considerably long. Efficiency is reduced to a great extent. Most of the houses in the village have kitchen outside the house and one of the reasons of having it outside is to avoid smoke inside the house. Smoke from the traditional chulhas during cooking is one of the major causes for ill health of rural women. Acute Lower

Respiratory Infections (ALRI) refers to various infections of lower respiratory tract mainly caused by bacteria in developing countries—the most serious case of which is pneumonia. According to WHO, 36 per cent of all ALRI is attributed to Indoor Air Pollution (IAP) from the use of biomass fuels (fuel wood, animal dung, crop residues etc.) for cooking, heating and lighting.

Better approach to solve the issues as mentioned above:

By 1994, some 15 million improved chulhas were introduced across the country. A survey by the National Council of Applied Economic Research found, in many cases, the stoves were not appropriately designed or had broken with use; over 62 per cent of the respondents said they did not know who to contact for repairs. According to 2006 International Energy Agency data, roughly 13 per cent of the world's primary energy supply can be classified as 'renewable'. Of this, new renewables—solar, wind, geothermal and cogeneration—make up just about 4 per cent and hydroelectricity 16 per cent. The bulk—80 per cent—of what is renewable comes from biomass burning, from the very chulhas of poor families. It is these families, living on the margins of survival, already vulnerable to climate change impacts, which are in the renewable Energy net. They are not the problem. This problem must be solved at the grass root level. Study of feasible raw material used, load bearing capacity of the model, must be made. Less material must be involved in setting up the chulha and must be easily portable when in time of need "Not only does it help many people living at very low income, it is also major step in developing rural masses of India".

Common inefficiency of the existing solution:

In existing solution work done is less with large amount of fuel (firewood) being consumed. Present days products does not accommodate the removal of ash in hassle free method. Fabrication of products are not precise and low fidelity techniques are adopted.



Identifying Customer Needs and Need Statement



5. Need statement

To design a portable chulha intended for rural and semi-urban India without involving sophisticated and expensive technologies.

Primary Needs

- 1) To cook eatables fast**
- 2) To conserve fuel**
- 3) To emit less smoke**
- 4) Hazel free ash disposal**

Secondary Needs

- 1) Easy to use**
- 2) Adaptability to any climate/ environment**
- 3) Light weight and multi-purpose**

Tertiary Needs

- 1) Thermal proofing**
- 2) Storage facility**

Mission statement

Product Description:

Light weight chulha, which is suitable for extreme climatic conditions. Height of chulha is kept well under 10 inches to help Indian users who prefer cooking sitting on the ground.

Fuel used can be charcoal or fire wood. Ash collection tray is provided for easy retrieval and disposal of the same. M.S steel is used for external fabrication of the chulha. Small storage unit is provide to hold kitchen instruments like knife, scrapper etc. Main load bearing skeleton of chulha is built of caste iron. Top surface is a iron plate for making roti and a burner attached for other vessels. Overall weight of chulha is around 10 – 12kgs.

Key Business Goals

Make chulha available for rural and semi urban masses of India. Whose fuel consumption is economically and is financially affordable for a common man. Improve the living standards of below poverty line sector, which in turn impacts the growth of india as a developed country.

Primary Market

- ***Target market audience are homemakers, daily wage workers, make shift construction site laborers.***
- ***Portable nature of chulha can be beneficial to most of the rural masses***

Secondary Markets

- ***Small Road side dhabha, food on wheels (moving vehicle which sells food).***
- ***Assumptions***

Will solve 90% of present design flaws of existing products, user will not be suffocated due to smoke, economical and highly user friendly. Needs less or no user instruction manual. Light, portable universally acceptable design.

Stakeholders

Manufacturing Company whose patent rights are at its own discreet. Government of India can invest on large scale fabrication of the product which can benefit lacks of people across the country. For example: IIITDM Jabalpur has been considered as Facilitator of this product.

- Stove-makers:*** The stove-maker is the person who sets up the required infrastructure to make and sell the stoves.
- Mold-makers:*** The mold-maker makes the actual molds that are used to cast the stove pieces.
- Suppliers:*** Suppliers provide the raw materials for the stove, as well as stove parts like the chimney and steam cooker.

d) Stove-users: Stove users are the buyers of the Low Smoke Chulha. A satisfied stove-user is the best promoter of this cooking solution.

6. Data Collection

Capacity of the domestic stove:

A domestic stove often serves on an average about 5 members in a family. The same stove should also support if there are more number of guests on occasions say 10 members. It is very difficult for many families if they can't have this flexibility of cooking. The range of cooking pots used are of 1 to 5 liters capacity.

Fuel wood

Size of fuel wood: It was observed that for fuel many testers chose thin sticks. In our region people chose wood of 1.5 inches to 2.5 inches diameter. The wood is never split perfectly into square cross sections, as usually one uses during the testing of stoves. Splitting the wood into thin size say 2 cms x 2 cms is very difficult and consumes energy and time. The length of the wood is usually about 1.5 feet to 4 feet. Bundling and transportation of the cut wood is not convenient if the wood length is too short. Sometimes the wood carried by head loads is very long say about 5 to 8 feet in length. The women / men balance the wood on their heads, to carry it. In a tribal area, people use trunks of wood without cutting as fuel wood, they are often 6 to 12 feet in length and nearly 4 inches to 12 inches in diameter. The trunks of wood as fuel is a common practice for many institutional stoves. Such usages are commonly found in the habitations located in the forest areas / in forest fringe areas.

Type of wood:

Different types of wood are available such as Neem, Accacia Nilotica, Prosopis Juliflora, etc. Wood moisture: In many tropical and semi-arid environments on a dry day the wood moisture varies between 12 to 18%. Very thin wood <1 cm is used for kindling. Sometimes kerosene is used (about 5 to 10 ml). Thin wood is not preferred by communities for cooking (except for kindling). Thin wood burns conveniently with very less smoke, but sometimes they yield soot. The stove users does not like soot deposit on the utensils

and on their walls. The bark of the wood although good for fire but sometimes leads to excess soot emissions. The kerosene added for starting the fire, leads to conspicuous soot

Cooking conditions

In the semi-arid region, cooking is often done in semi-ventilated conditions. The cooking pots are closed with the lid while cooking. Sometimes for stirring / during simmering of rice, etc. the lid is opened or semi-closed. While making Rotis the pan is completely exposed. Utensils used for cooking vary: i.e., pots are cylindrical, taper from mid-way of the pot, semi-spherical, or bowl shape, etc.

Size of the stove:

In our region, 8 inches height of the stove is ideal. Any stove too high about 12 inches or more is inconvenient. Women prefer sitting comfortably on the floor and cook. Many of the activities done by women in the rural areas are by sitting. Especially while making rotis, they prefer the low height of the stove. Scientifically the chimney effect would help the smoke to burn in tall stoves. But, as per the ergonomics and local practices, it is not convenient to the user. Sometimes a scientist is successful in the lab, but fails at the community level. Often the pan for making rotis is about 10 to 12 inches in diameter. In a 4 inch diameter stove, the stove should be operated in high power for the flames to spread underneath the pan for complete burning of a roti. The diameter of the stoves about 7 inches is ideal for different types of the utensils used in the region.

Air for combustion

There are three sources of air possible for a stove: - Primary air, Side air and Secondary air.

Primary air

This air is mainly from the bottom of the grate / underneath the wood. Excess of air flow will, lead to excess / uncontrolled combustion. Primary air is always required in less quantities. If this air is preheated before reaching the wood it will make the stove perform better. The embers at the bottom of the grate, sometime

after preliminary combustion are very much useful for preheating the primary air.

Side air:

In majority of the traditional stoves this is the only source of air. From the fuel feed opening this air gushes. In three stone stoves from all the three sides this air gushes. Too much of this air in open air conditions has dampening effect on the flames. Controlling gushing side air is also important. If the mouth of the fuel feed is completely closed due to over feeding of the stoves by wood in traditional stoves, sometimes leads to extinguishing of the flame and release of excess smoke. Using side air shutters is a good idea. Using simple small holes on the sides, as given in Magh 3G, would also help. In efficient stoves the fuel feed opening should be reduced, as already primary air facility is given.

Secondary air

For all TLUDs this is an important feature. This feature can also be given to the domestic stoves (as compared to TLUDs, few holes can be given), which helps in complete combustion of any smoke otherwise left. In the efficient stoves without chimney effect, this is a very useful feature.

Note: It is convenient to use a stove in open air conditions with all the three air features (primary, side air and secondary air), as compared to other stoves.

Persona



Name: Maya yadav

Interest: Farming, Stitching Cloths

Age: 32

About the user:

Education Qualification 2nd STD

Homemaker in her early thirties, she looks after family of 7 which includes three kids, husband, husband's mother and father. She gets up every morning at 5am starts her household chores.

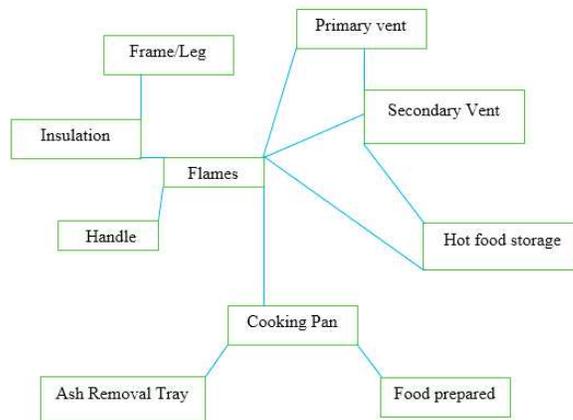
Work load:

Cleaning house, feeding cattle's, preparing breakfast, lunch, dinner; Washing cloth etc.

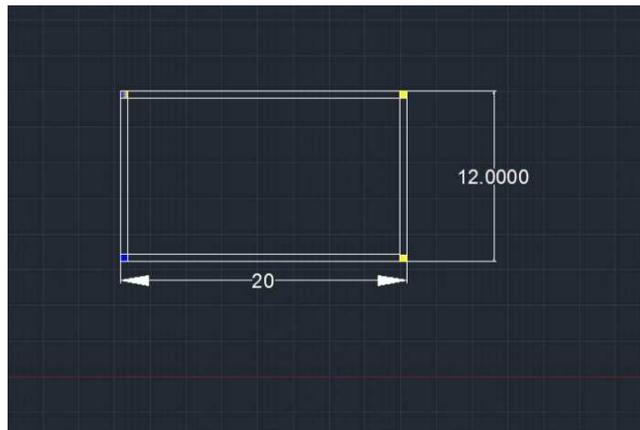
Responsibilities:

To look after house, milk the cow and help husband in the fields during harvest season.

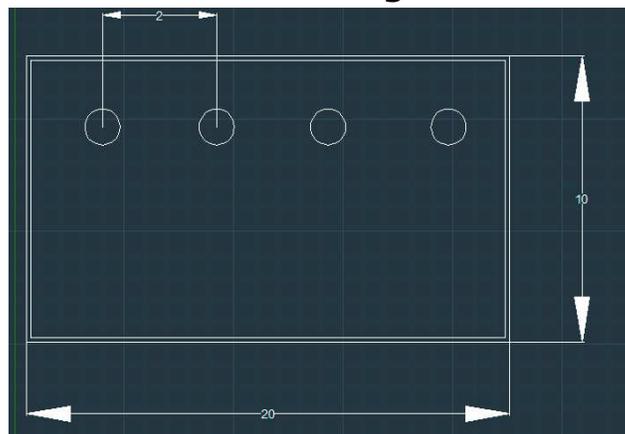
Product Architecture and Parametric Design



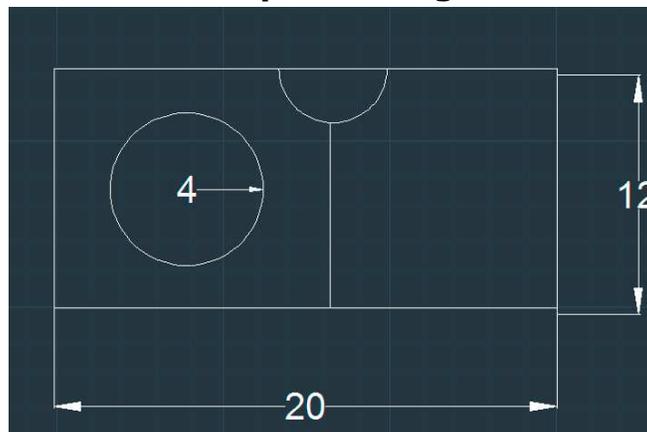
Framework design

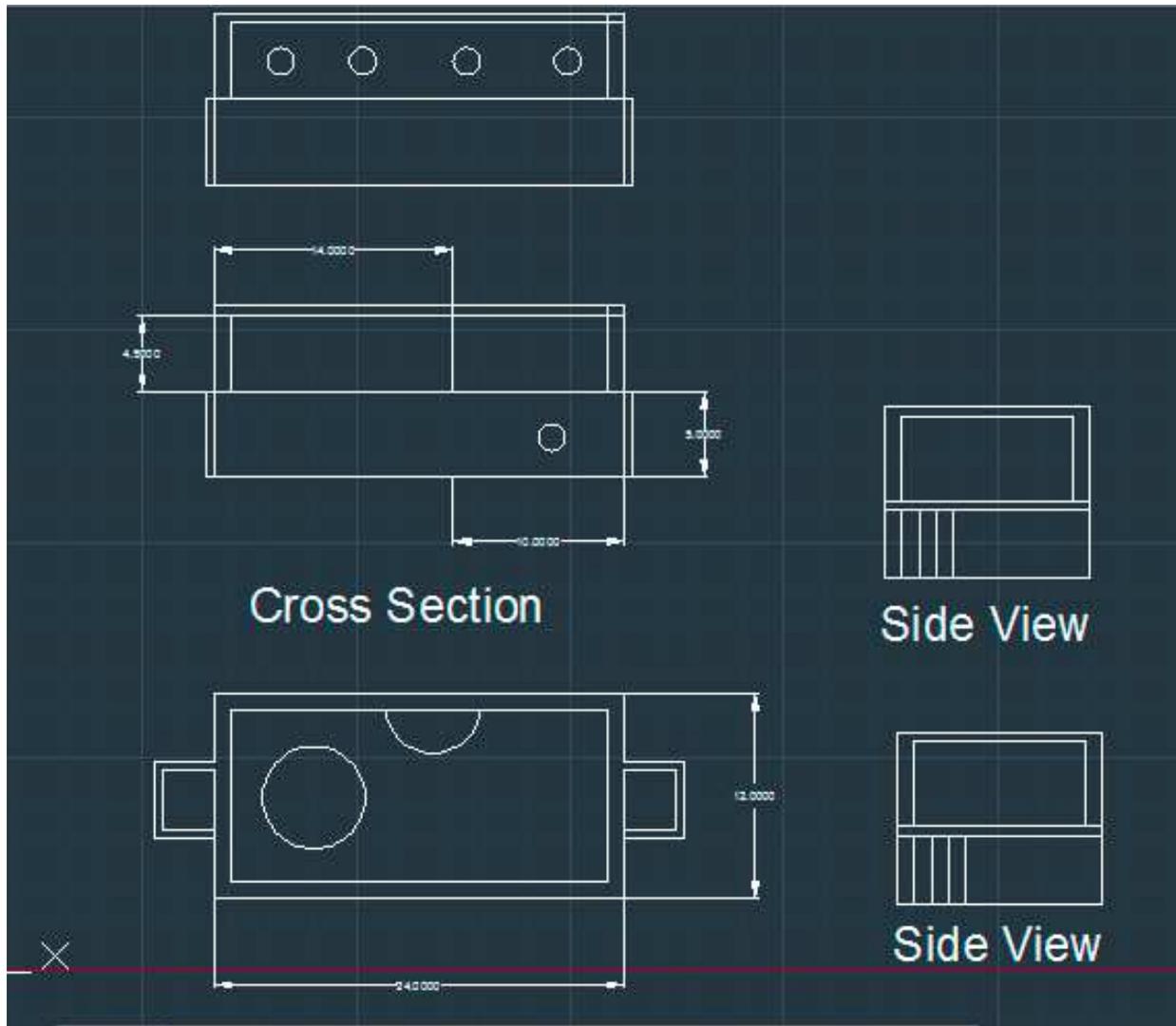


Vent design



Hot plate design





Prototype





7. Result

The chulha made targets rural and semi-rural masses in India, it can be manufactured and distributed at very low cost. Chulha designed not only improves efficiency of cooking but it also provides a chamber to keep the food hot for a long duration. This chamber acts like ready oven for poor and underdeveloped section of a society.

8. Conclusions and future work.

Since the heat energy is trapped in a closed space, it increases the efficiency of stove. Consumption of fuel is reduced on a large scale. Multi-function like food storage camber, hazel free ash removal system improves the basic features of a typical Indian stove.

Future work includes iterations of stove and minor design changes which ranges from primary vent to stability of the stove. Heat energy stored in the smoke can be efficiently used to heat up water/ can be used to keep the food warm.

Material involved in building the stove can be developed and lighter material can be used.

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Ganesh S



Balasubramaniyan is an Industrial designer who has completed his bachelors in automobile engineering. He is interested in Product innovations, frugal innovations, product styling, design simplicity and design for business.

He is currently working on project on the domain of agriculture and plans to do research on frugal innovations

GRAVITY POWERED AGRO-FRIENDLY PUMP

Balasubramaniyan

1. Introduction

In India the diesel powered irrigation pumps have been feeding the crops and the small scale farmers to lead a ordinary life with their small plots of land, but diesel being an non-renewable source of energy has been rising in price at a faster rate, when compared to the income the farmers which they make out of their land. Also it makes financially harder for irrigation. Most of the times the small scale farmers face a financial squeeze and are forced to abandon their profession and move to nearby towns for daily wage works.

Even though solutions like solar powered pumps are available which solves the fuel and environmental problem, it is not being able to serve the need of a specific Indian small scale farmer, such as a pump with high efficiency and low economy.

2. Background

The small scale farmers in India mostly belong to the area where electricity is unreliable and non-existent. They need to pull the water from underground and deliver it in their fields where diesel pumps become the most common choice. Even though they are of less cost in the initial stage the rising cost of fuel and the negative ill effects like water, air and soil pollution makes the livelihood of the farmers, fragile in long term.

A renewable energy powered pump whose power source is free or economically cheap with less preferably non pollutant could be an desired solution to be considered. Currently there is no such pump is available the Indian market that fully meets the requirement of the Indian small scale farmers.

Target users

Small and medium scale Indian/ farmers

Needs

The analysis of the data among the users is been translated into desired needs of the user. The pump should be:

- **Portable**
- **Theft prevention**
- **To use it in well of any farmer**
- **Robust**
- **Should be robust under all climatic conditions**
- **Efficient**
- **Should irrigate a land of 5 hectare from a depth of 5 Metre**
- **Locally serviceable**
- **Low cost**

This pump is expected to be capable, Viable, affordable and feasible when compared to that of diesel pumps.

3. Methodology

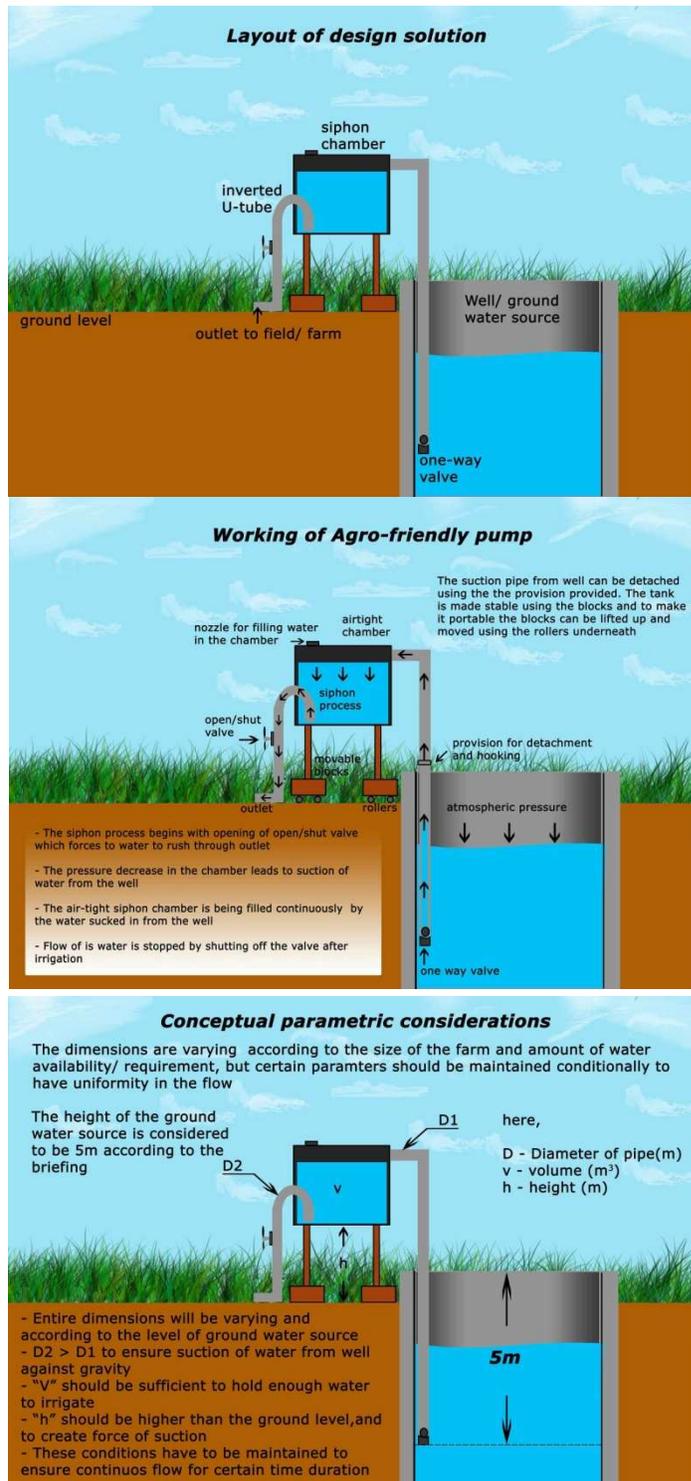
The method of developing such a concept involves principles of frugal innovation, generic product design principles and laws of physics. "Make familiar strange; make strange familiar", "SCAMPER" were some of the principles used from methods for concept generation in product design. The "siphon principle" and "laws of gravity" are the laws of physics used in developing this concept.

Make familiar strange; make strange familiar is the method where we put the strange methods like we use it familiarly or the vice versa. SCAMPER – Substitute, Combine, Adapt, Modify, Put in other use, Eliminate, Reverse.

Siphon principle

Siphon usually refers to an inverted U-Shaped tube which causes the liquid to flow uphill above the surface of the reservoir without pumps powered by the fall of the liquid as it flows down the tube as it flows under the pull of gravity, and is discharged at a level lower than the surface of reservoir it came from.

4. Concept





5. Results and discussion

This concept is a hypothesis and requires detailed research. When compared to the diesel pump this has low discharge rate, but this factor is negligible when compared with no fuel consumption, no smoke emission, less maintenance, and no power.

This is ultimately simple just like operation of a faucet adapting to farmer's routine. Very cheap than any other existing pumping system to date making it affordable for the farmer without any subsidies from government.

No technological advancements are required, the basic factor to be maintained is the dimension which must be appropriate according to the ground water level. It uses the world's greatest most unnoticed natural source of energy – Gravity.



Balasubramaniyan



Amaltas Khan

A product designer and design educator by profession. Amaltas Khan is a research scholar at Design Discipline, PDPM Indian Institute of Information Technology, Design and Manufacturing Jabalpur. He has worked on numerous projects focused on design interventions for social well-being. He is also keen for developing methods, products and services to produce frugal design solutions for the people at the bottom of the pyramid. His other interests include prototyping and material exploration.

Pelican- *Crafting scissor designed for children*

Amaltas Khan

1. Introduction:

Designing products for children is always a challenging task as there is an absence of predefined process for performing a task. Often, they interact with products for the first time and it takes a considerable time to understand and operate a product. Children are at a stage where they learn by doing. "What" they perform and "How" they execute, defines their attitude in problem solving for the life ahead. Products are the carriers of values. For instance, if a scissor of regular use is annoying a child repetitively, it may result to his irascible behavior. Special care and sensitivity should be taken to develop products keeping the probable issues that may derive from its use.

Designing craft scissor is a challenge taken to understand the psychology and activity of children. A design solution is connected to all the issues related to the consumer in a defined scenario. All the aspects of human-product interaction e.g. human factors, ethnography, technology, etc. are blend together to derive a solution. Along with product design, we also trying to improve the design process and merge it together ina task specific method. A novel strategy was explored to make a scissor which can be efficient in speaking about itself. The major challenges involved in the exercise were:

- a) Understanding a beginner's psychology***
- b) Developing a task specific product development strategy for toy design***

2. Data Collection:

Major data collection from the literature survey has been analyzed to understand the phenomena of cutting with a scissor. A focus group of children with different age groups were asked to perform a set of tasks with different designs of scissors. The results found are tabulated as follows:

No.	Issues found	Relevant reference images
1	<p>Tedious to perform complex craft cutting tasks. Most of the tasks include complex shape cutting from a sheet which requires control in movement of scissors. Children lack in this control and therefore the shape cut out is unsatisfactory.</p>	 <p><i>Fig 1. Complex cutting tasks [1]</i></p>
2	<p>One hand is always occupied in controlling the cutting medium and the other in using the tool. Children are unable to apply pressure to cut thick sheets.</p>	 <p><i>Fig. 2 Use of hands during activity[2]</i></p>

<p>3</p>	<p>The dimensions of hands of kids vary in substantial manner. It fits to a limited age group of children and is uncomfortable for others. It makes the scissor uncontrollable and uncomfortable for use.</p>	 <p>Fig. 3 Highly varying size of hand wrt fixed size of scissor [3]</p>
<p>4</p>	<p>Craft Scissors in the market are colorful but with time the static emotional attachment is reduced in children. There is a need of dynamic attachment to attract and involve the kids every time they use the scissors.</p>	 <p>Fig 4. Absence of dynamic attraction in competitive market [4]</p>

3. Need Identification

The attributes needed for solving the problems with the existing scissors were categorized into two divisions, technical and emotional. This division will help us to generate the concepts independently and then further we can blend them together.

a. Design parameters (Technical):

- i. It should be able to perform various identified crafting tasks.*
- ii. It should be functionally easy to use.*

b. Design parameters (Emotional):

- i. It should include product semantics for kids.*
- ii. Design should include a metaphor for emotional attachment.*

4. Concept Generation (Functional):

Concept were generated with focusing on the primary design parameter of "ease of use" for "identified crafting tasks". The concept generation was further converged to use of single hand for controlling the tool and providing other hand free to control the medium.

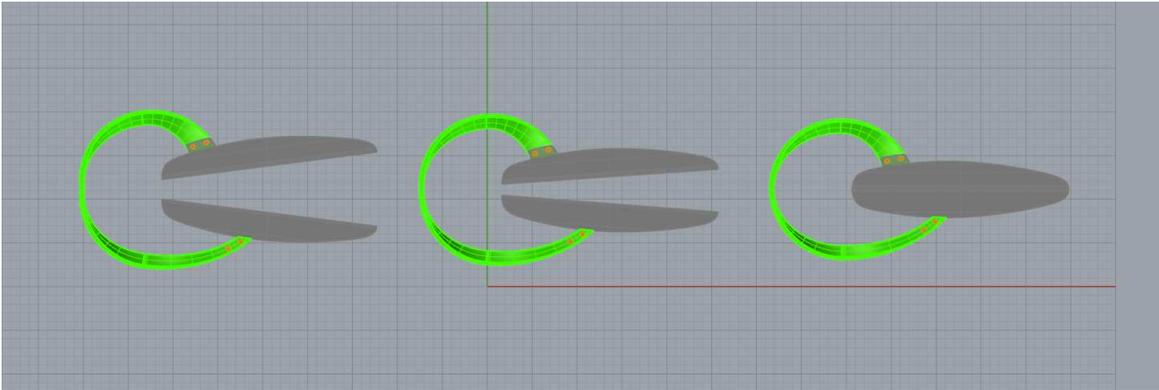


Fig. 5CAD model detailing of the concept developed.

The concept generated (Fig. 1) will make the following improvements over the other scissors:

- i. Let the user use only single hand to control the tool*
- ii. For complex tasks, the scissor is provided a space to let the user reach the center of the paper without cutting its edges.*

5. Concept Generation (Emotional):

Once the first part of the concept generation is completed and the internal structure is finalized, the external part of the design is required to be finalized. The functional part of the concept might be appropriate but we need to design the external part which will communicates with the user.

The major domains we have to look into are:

- a. Product Semantics: The product should be able to communicate on holding posture, positions etc. (Fig 6)***
- b. Aesthetics: The product should be dynamic and attractive enough to create interest of the user as children lose interest more often than adults. The design is inspired from Pelican bird, having characteristics t hold items inside its beak.***

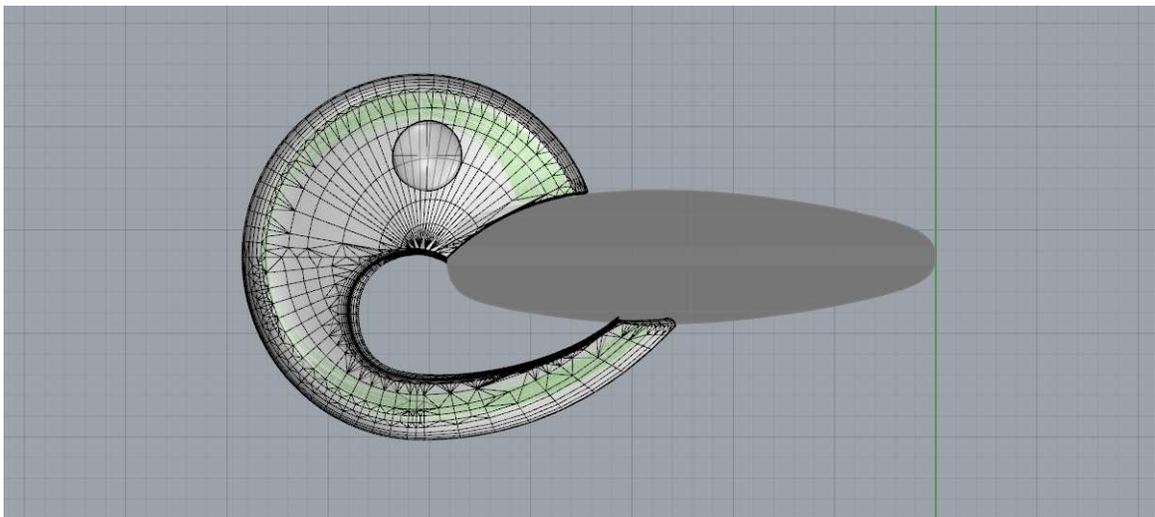


Fig. 6 Outer structure (mesh) of the concept

6. Detail Design

Pelican is a craft scissor for kids which can cut the item without touching the edges. Inspired from the pelican's feature to "contain" item inside the neck (fig. 7). Metaphor of a pelican is captured to create interest among kids.

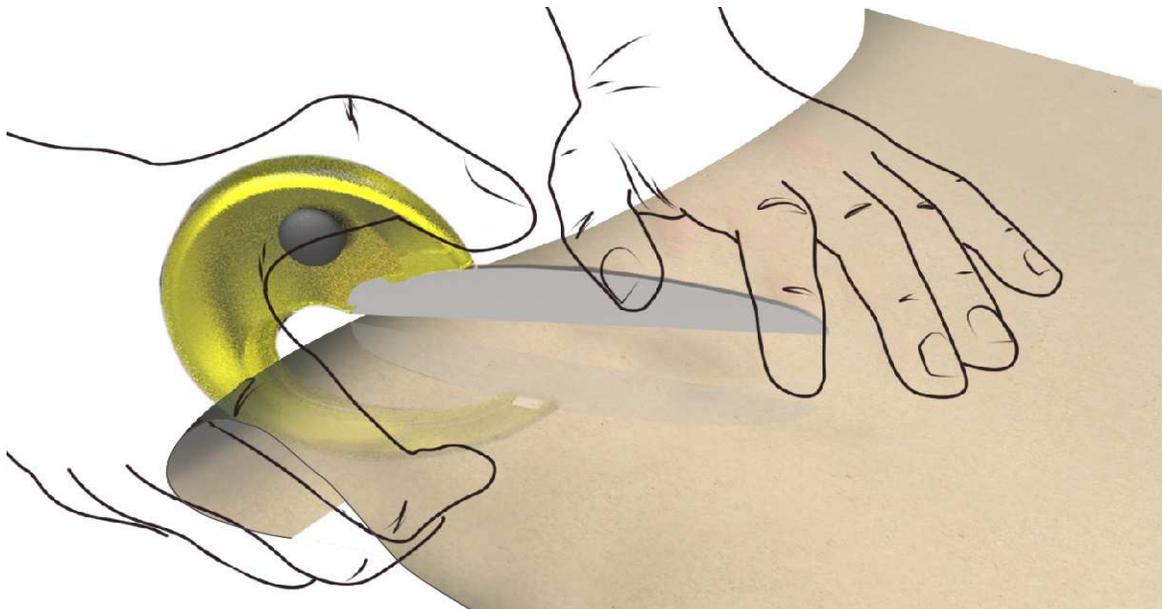


Fig. 7 "Pelican" scissor cutting through, without touching the edges

During craft exercises, kids have to cut in between the sheets e.g. cutting out a circle, to cut out a complex shape. Children have different unorganized ways to hold the scissor and achieve the cut, which are inefficient ways of completing the task. Moreover cutting in between cloth and plastic sheet is even more difficult.

Pelican is designed to serve as a conventional scissor, giving an advantage of comfortably cutting through various mediums. It can cut through sheets without touching the edges. Design is simplified and iterated to achieve a simple and clean design.

Function and Internal Structure

Scissor blades have to be in close contact with each other to enable shearing. In pelican scissor even though axis of rotation is far away from cutting edge but the close contact is achieved by elasticity of tensile steel member. Pelican just fits in the contour of hand (fig. 7) with fingers and thumb at load points, giving better gripping surface and ergonomics in use.

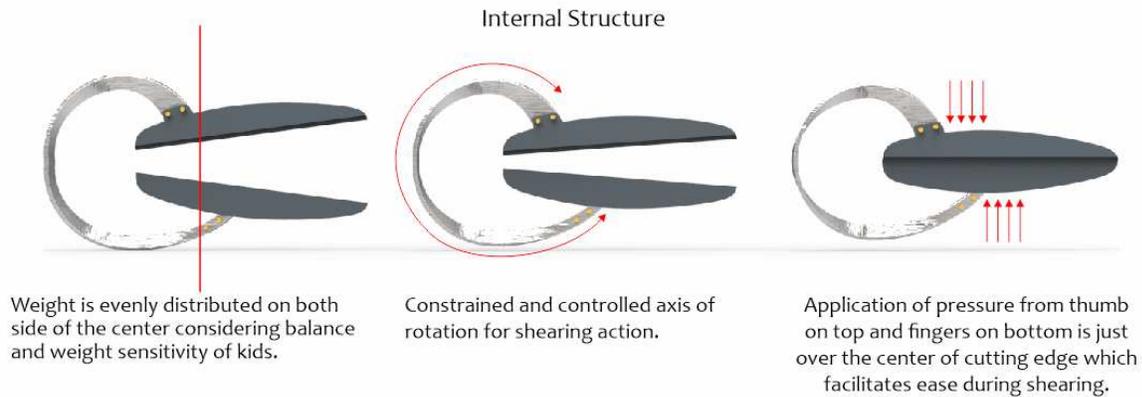


Fig. 8 Internal mechanism of the design

Material and Manufacturing

Carefully designed mechanism to achieve simple and clean design. The materials used are also cost effective and simple manufacturing techniques can be used to fabricate the design.

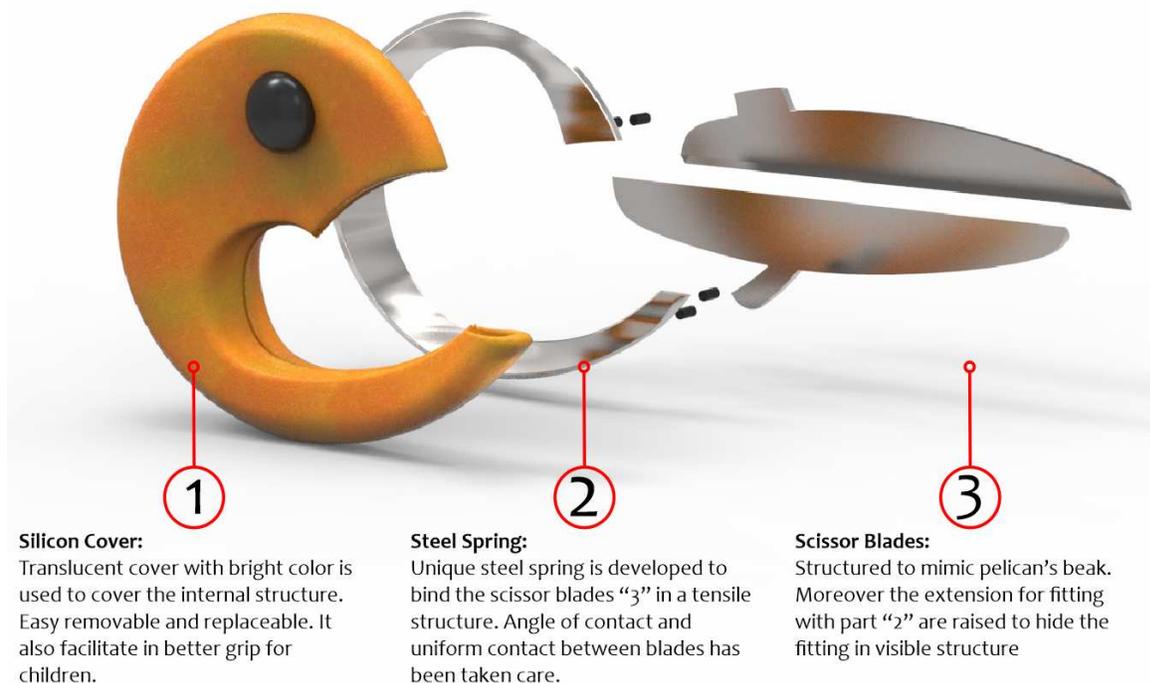


Fig. 9 Material and parts of the scissor design

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Amaltas Khan

BOOK RECEIVED:

1.A New eBook from UniversalDesign.com

Universal Design Tips: Lessons Learned from Two UD homes

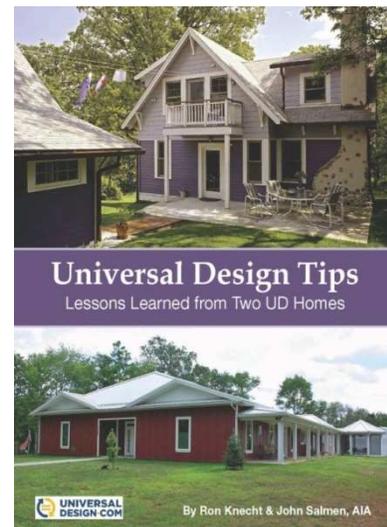
This new electronic book from UniversalDesign.com is filled with tips and ideas that will help guide anyone through the process of designing and constructing their own Universally Designed home. The book was co-authored by John Salmen, AIA, the publisher of *Universal Design News* and founder of UniversalDesign.com, and Ron Knecht, whose durable, energy efficient Universally Designed house was featured in the **January 2012 issue** of *Universal Design News*.

The first section of the book deals with the planning process, providing insight on how to choose a location for the house, consider activities of daily living during planning, best use various types of design professionals, finalize a floor plan and develop a building schedule.

The rest of the book is organized according to different areas or elements of the home (i.e. exterior doors, bathing, and kitchen counters, just to name a few.) Whether designing a whole house or simply remodeling one area, *Universal Design Tips* makes it easy to quickly refer to the relevant section and find valuable tips that ensure success. Each of these sections includes design tips, photos and important lessons that the two authors learned through their personal projects.

John Salmen has been working in the field of accessible architecture and Universal Design for over 30 years, and he put this expertise to good use when remodeling a historic property to create the Universally Designed house he and his wife hope to live in for many years. Salmen's "Home for the Next 50 Years" has been featured in various media outlets: including *The Washington Post*, *Fine Homebuilding*, AARP's television show *Inside E Street* and the book *The Accessible Home: Designing for All Ages and Abilities*. Now, readers will be able to explore Salmen's home in even greater detail and apply his experience to their own Universally Designed home projects.

Ron Knecht's experience with Universal Design started after his wife of 46 years became ill with cancer. As her health worsened, Knecht learned first-hand the importance of accessibility for maintaining independence, safety and one's quality of life. Before Knecht's wife



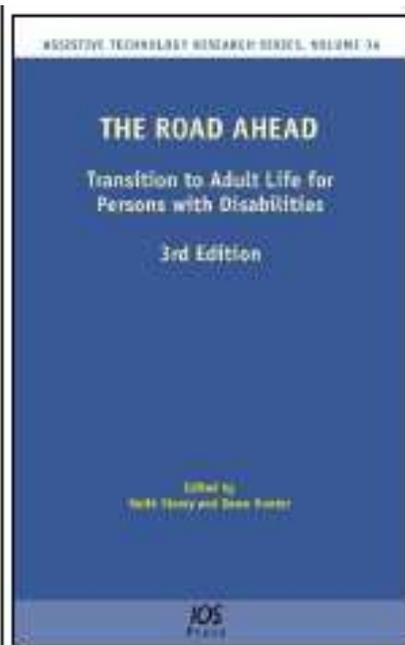
passed away, she extracted a promise from him that he would move to a Universally Designed house located closer to their daughter. Knecht was underwhelmed by both the houses that he saw on the market and the UD house plans that he found online; he realized that he would have to plan and build a custom house in order to fulfill his promise.

2.



China Design Index 2014: The essential directory of contacts for designers Paperback – February 1, 2014 by Robert A. Curedale (Author)

3.



The Road Ahead

Transition to Adult Life for Persons with Disabilities

Volume 34 Assistive Technology Research Series
Editors: Storey, K., Hunter, D.

December 2013, 318 pp., hardcover (revised 3rd edition)

ISBN 978-1-61499-312-4 (print)

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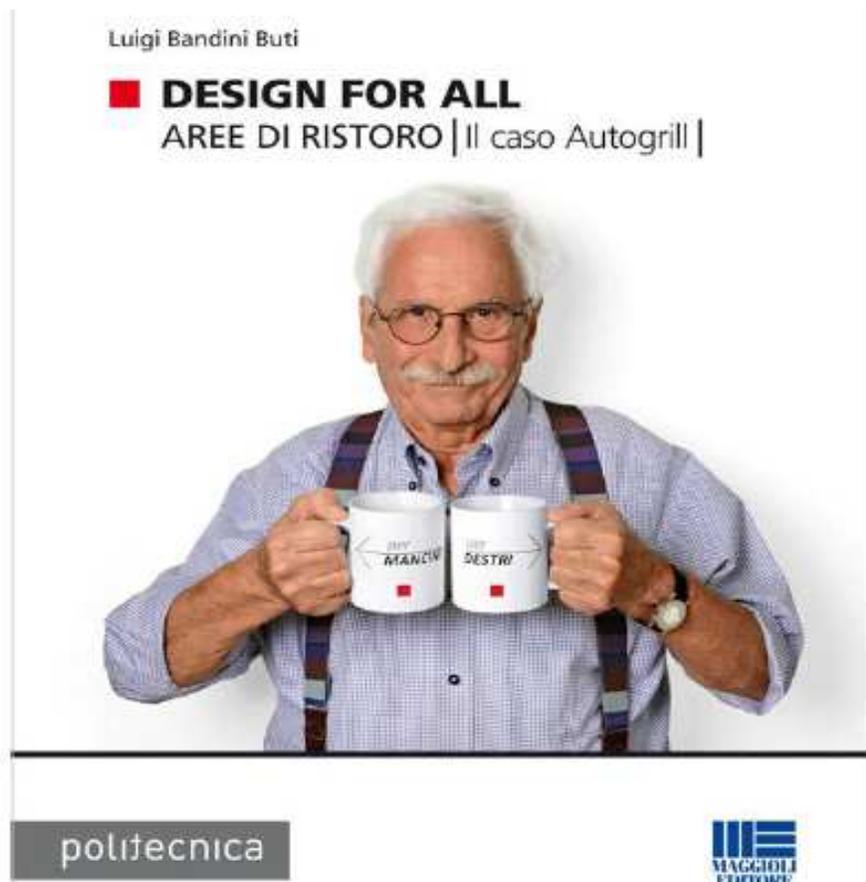
Price: €69 / US\$100 / £59

Successful transition from school to adult life has always been difficult for people with disabilities, especially in the area of employment. The vast majority of people with disabilities are either unemployed or underemployed with low wages and few benefits, and many governments are struggling to find a way of providing employment and benefits to people with disabilities without creating disincentives to work.

This book provides strategies and ideas for improving the lives of people with disabilities, exploring new ways of enabling a successful transition to an integrated adult working life by providing effective instruction and support. Following an introduction which outlines the importance of transition services and meaningful outcomes, topics covered in the remaining chapters include: person centered transition planning; enhancing competence and independence; employment assessment and career development; collaboration between agencies for a seamless transition; independent living and supported living; and community functioning skills.

The book will be of interest to all those who work with transition age students as well as those who work with adults with disabilities and want to enable them to have the best life possible. To paraphrase Helen Keller: "People with disabilities not only need to be given lives, they need to be given lives worth living."

4.



Luigi Bandini Buti

DESIGN FOR ALL | AREE DI RISTORO | il caso Autogrill |

Maggioli Editore, 2013

<http://shop.wki.it/risultatoricerca.aspx?indizioricerca=luigi+bandini+buti>

This book has been born following the collaboration with Autogrill that, for its new facilities "Villoresi Est", has developed an innovative, Design for All oriented project. We then realized that the cares foreseen for "all" would not be noted by "the majority".

If you are not on a wheel-chair, or blind, or you are not travelling with a large family or you don't have to look after your old grand-father, you will not be able to appreciate many of the attentions included into the project. It was therefore necessary to make more visible the virtuosity of the planning process and its results, which may not appear obvious to many people.

This publication is not meant to be a mere description, it is rather a critical analysis of the Villoresi Est rest area, included in a context that wants to examine in depth the methods and the means of Design for All.

Its main objective is therefore to use the "Autogrill case" to investigate the necessary steps to develop projects Design for all oriented, hopefully in an authoritative way.

Edmonton Architect publishes - Adult Children's Book—Accessible Architecture: A Visit From Pops.

Edmonton Architect Ron Wickman launches his first book titled: **Accessible Architecture: A Visit From Pops** at the City Room in City Hall, Tuesday, March 18 at 6 p.m. Ron, son of the late Percy Wickman, MLA Edmonton-Rutherford 1989-2001, is a story written on the focus of Percy and his 3 grandchildren. Ron is best known for his accessible design. His most recent endeavor published by Gemma B. Publishing draws on this knowledge. Edmonton draughtsman Jared Schmidts illustrates with wit and precision the need for a house to be visitable by everyone.

As a child, Ron Wickman learned firsthand about the need for accessibility. His father became paraplegic after being injured by an industrial accident. Ron wheeled his father into many inaccessible places. A longtime Edmonton City Councillor Percy Wickman advocated for people with disabilities throughout his life.

Ron Wickman studied architecture in Edmonton and in Halifax, Nova Scotia, specializing in barrier-free design, designing houses and public spaces that were both beautiful and accessible.

Accessible Architecture: A Visit From Pops—is an adult children's book, which demonstrates the three principles for ensuring a house can be visited and enjoyed by everyone equally, including those with a disability. Following Wickman's design and renovation also enables homeowners to age in place.

Visibility principles include

- the front entrance must have no steps;
- all main floor doors must be at least 36" wide
- an accessible washroom must be on the entrance floor.

Accessible Architecture: A Visit From Pops, by Ron Wickman, illustrated by Jared Schmidts and edited by Sarah Yates, is published by Gemma B. Publishing, a Winnipeg-based publisher. Gemma B. Publishing creates heroes and heroines living with a disability, in both fiction and non-fiction. The book will be launched at Edmonton City Hall, March 18 at 6 p.m. and available later at Audrey's Books in Edmonton.

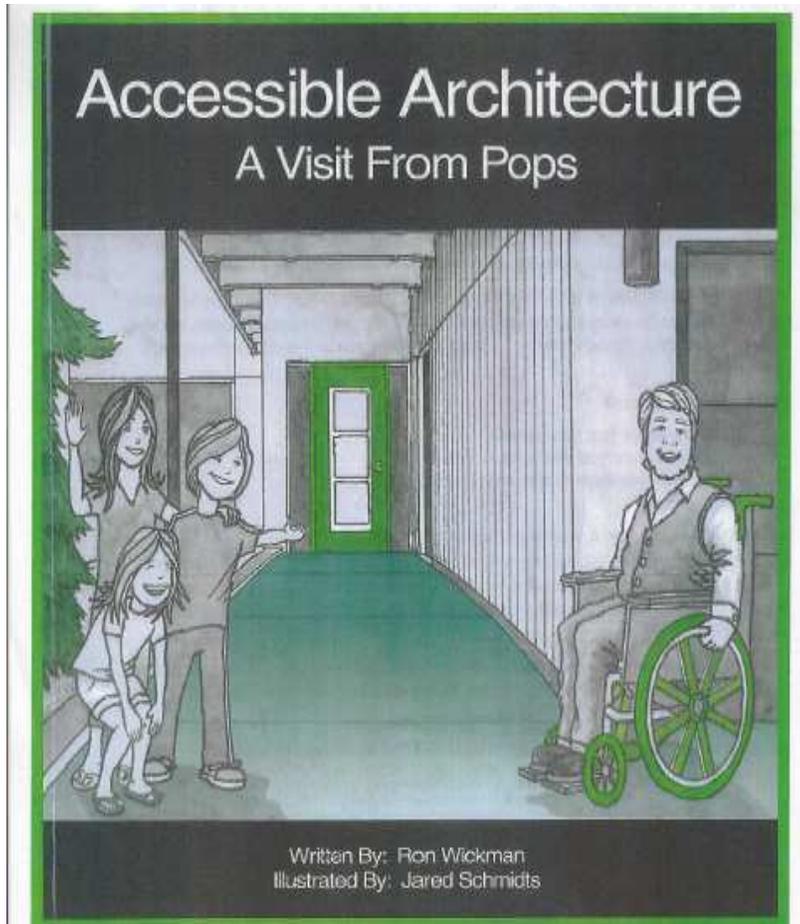
Ron Wickman will be available for interviews after the press conference at City Hall. His lecture at the Buidex Conference, Edmonton Expo Centre, Northlands will be held Wednesday, March 19 at 2:30 p.m.

Accessible Architecture: A Visit From Pops ISBN978-0-991697-0-8 sells for \$20.

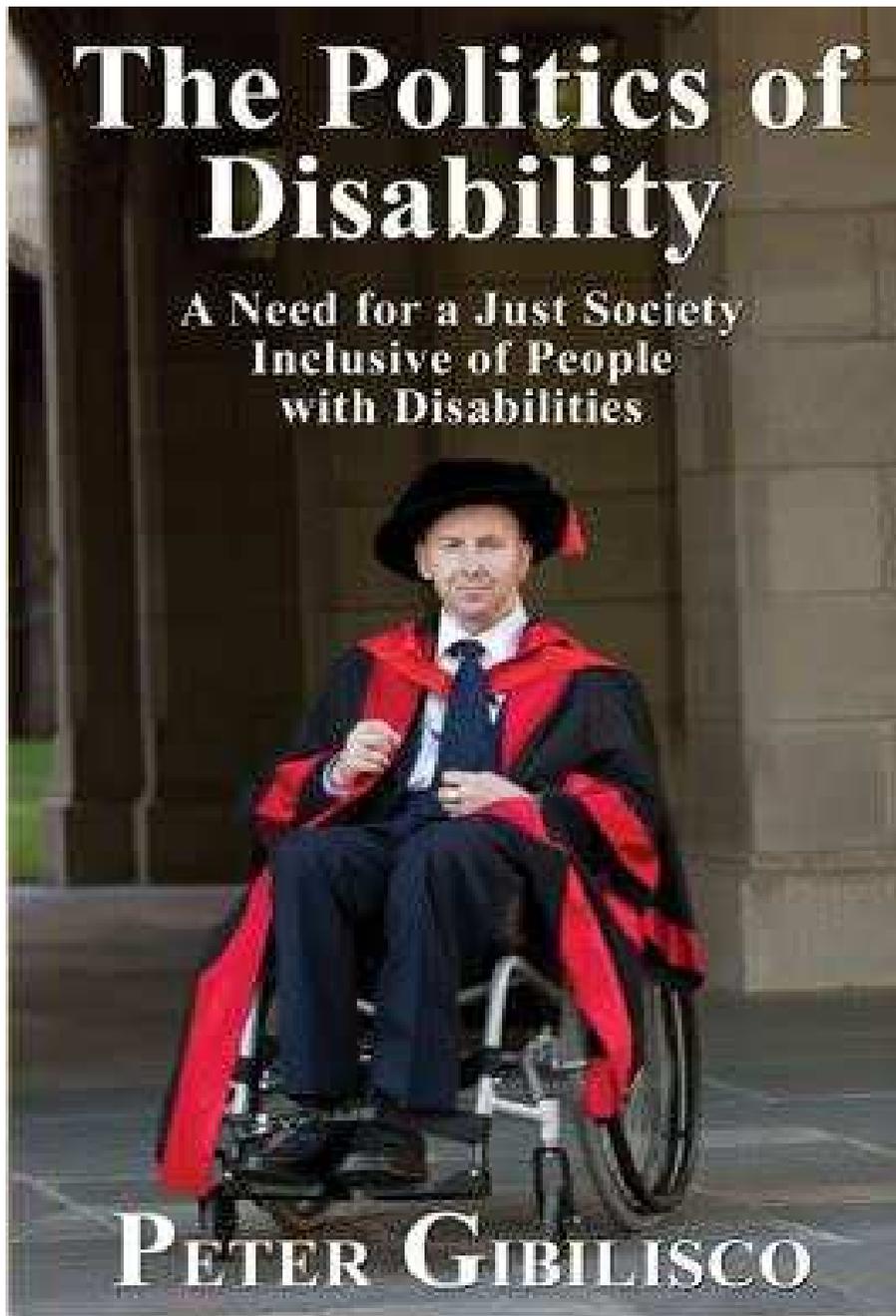
- 30 -

For additional information, contact:
Ron Wickman
Architect
780-430-9935
E-mail: rwickman@shaw.ca

5.



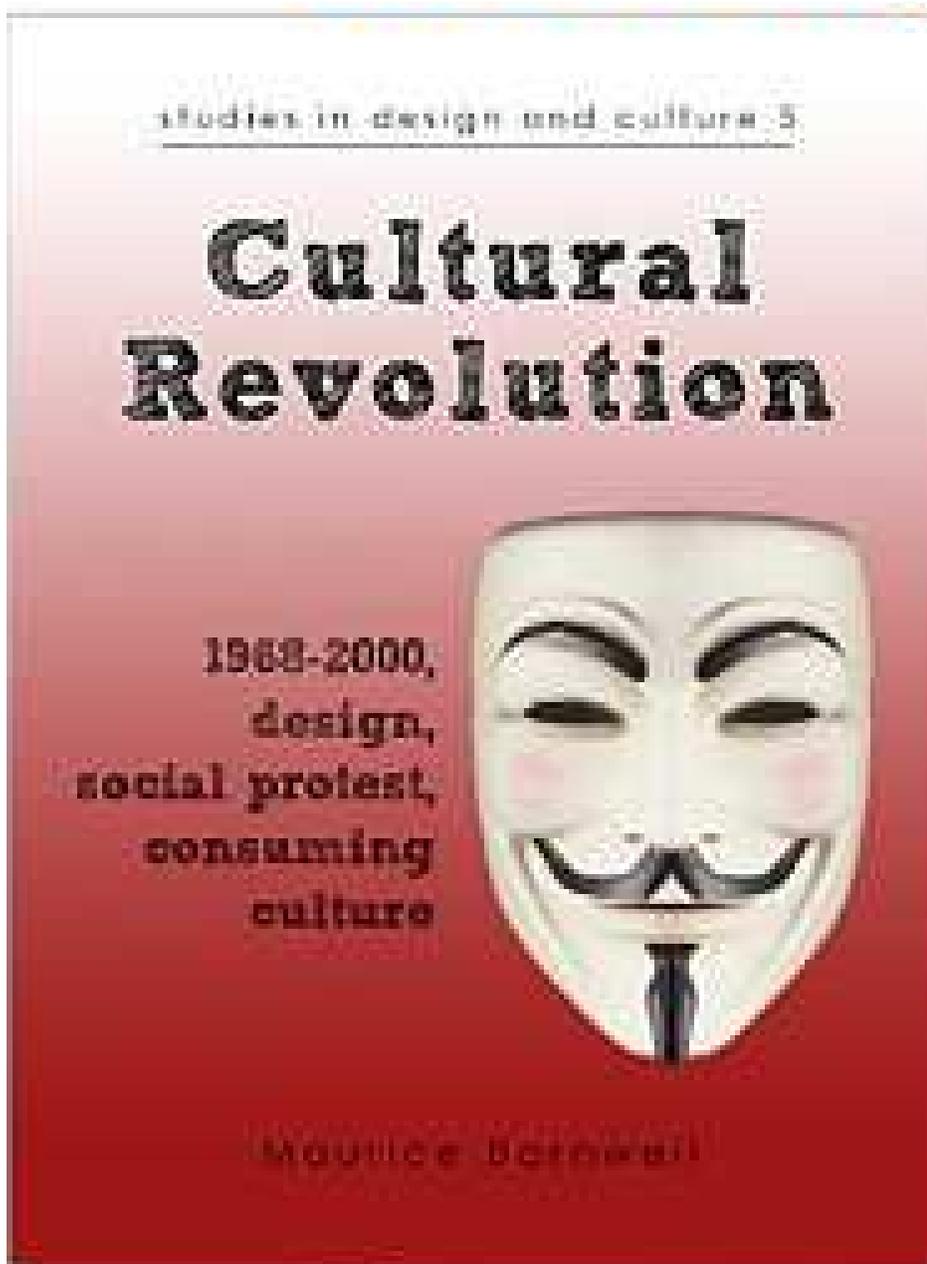
6.



This book will retail for a recommended price of \$19.95 USD ISBN 978-1-77143-155-2, with an ebook version also available at a recommended price of \$7.95 USD ISBN 978-1-77143-156-9. You'll be able to buy it from all the usual places - Angus & Robertson, Bookworld, Fishpond, Amazon, Kobo, iBookStore, and Google's Play Store, amongst others.

7.

Maurice Barnwell (Author)



8.

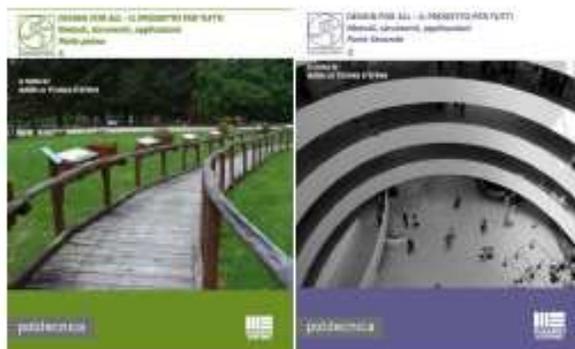
Design for All – the project for everyone. Methods, tools, applications. Volume 1- 2 (Steffan, 2012)

The publication highlights the multidisciplinary and cross-disciplinary of the Design for All approach, both in terms of issues addressed and of field of application. The accessibility of places and objects is nowadays a minimum requirement: it is only the starting point to allow their use by the widest range of people possible. Through professional experience and research, the paper tackles problems, methodologies and working tools, benchmarks.

The first volume covers the main areas of research and presents some examples at urban scale; the second volume illustrates examples of architectural design, products, services, university education.

The lack of compliance of the built environment and of the products, with needs that can be very different, causes a state of handicap. The lack of ability is a handicap only if the project has not taken it into account.

With these books we intend to stimulate debate, in-depth research, specialized studies, so that Design for All can be increasingly known and applied in more and more research and professional areas.



Published in Italian in December 2012 by Maggioli Editore (Santarcangelo di Romagna RN, Italy).

http://ordini.maggioli.it/clienti/product_info.php?products_id=8832 Volume 1

http://ordini.maggioli.it/clienti/product_info.php?products_id=8833 Volume 2

The on-line English version is also available since October 2014:

<http://www.maggiolieditore.it/ebook/tecnica/design-for-all-the-project-for-everyone-first-part.html>

<http://www.maggiolieditore.it/ebook/tecnica/design-for-all-the-project-for-everyone-second-part.html>

"Ideas, even good ideas, flourish only when practitioners commit to sharing their experiences, perspectives and aspirations. By organizing this publication and convening a distinguished international group of contributors, Editor Isabella Tiziana Steffan helps to establish the current state-of-the-art and affirms the significant potential of Design-for-All. She also delivers fresh inspiration to an expanded audience critically important to engage if Design-for-All/Universal Design is to realize its promise in the coming years.(...)We salute Editor Steffan for her passion, focus and hard work to bring this valuable contribution to fruition." (Valerie Fletcher)

APPEAL:

1.

I am currently pursuing my Ph.D. from IIT Delhi in the domain of Industrial Design. My dissertation topic is Design Forecasting with ref to Product innovation.

Please help me by filling this questionnaire. And also recommend it to your friends/juniors/colleagues.

You can find the survey at:-

<http://www.surveymonkey.com/s/innovation-forecasting>

There are just 14-15 questions related to product innovation and the factors which are important for planning/designing our future. It would not take more than 7-8 minutes to finish this questionnaire. There is also a surprise gift in the end of the survey form, a specially designed poster featuring the great classical products of the last century, in high resolution, ready for print.

Design-for-all is a formidable design community and has a widespread global reach. Through it my survey form can reach design practitioners, academicians and stake holders at various levels. I request you to help me by forwarding this through your mailing list. I am really counting on your help and shall be deeply thankful to you for this.

You may also share it on FB, linked-In, or in your network of friends and recommend it to anyone whom you find appropriate for this study.

Thanks and best regards

Sugandh Malhotra

Mob: 9810296933

NEWS:

1. AMA Could Be More Creative With These Churches I find the current practice of churches holding services in basic public schools to be a potentially profitable avenue for our metropolitan, municipal and district assemblies that own and operate these schools. Consequently, I find the recent directive issued to churches to desist from using these public facilities for their services to be woefully bereft of entrepreneurial acumen (See "AMA Bans Churches from Worshipping in Classrooms" Citifmonline.com / Ghanaweb.com 1/22/15). We are told that the directive follows several incidents in which worshippers have damaged classroom furniture. In other words, these Christian worshippers - or devotees - have become a quality-of-life nuisance to the schools whose operatives have allowed them the use of such facilities. I am assuming that the use of such public property attracts rental fees, which could be used in effecting badly needed maintenance and repair works for which Assembly revenue may neither be forthcoming nor readily available.

If the preceding observation has validity, then it appears to me that stringent rules ought to be laid down to govern the disciplined use of such facilities and rigidly enforced by, for instance, hiring building superintendents and/or monitors to ensure that furniture in these mini-academies is handled with appreciable care. Failure to do so could then be profitably punished in the form of reasonably exorbitant surcharges. I am quite certain that these public facilities are also regularly rented out for non-religious activities, while they are not in active use for the purposes for which they were constructed.

All that needs to be done here, as well, is for facility managers and/or their assigns to take stock of the furniture and document their general condition at the time of rental. And then billing the renters for the cost of any property damage or abuse that may be clearly ascertained to have occurred during the course of the usage of the same. Collectively punishing the users of these facilities with wholesale summary prohibition does not seem to me to be very progressive, justifiable and business savvy. Instead, each group of worshippers ought to be treated on a case-by-case basis, according to how responsible a particular group of worshippers conducts itself.

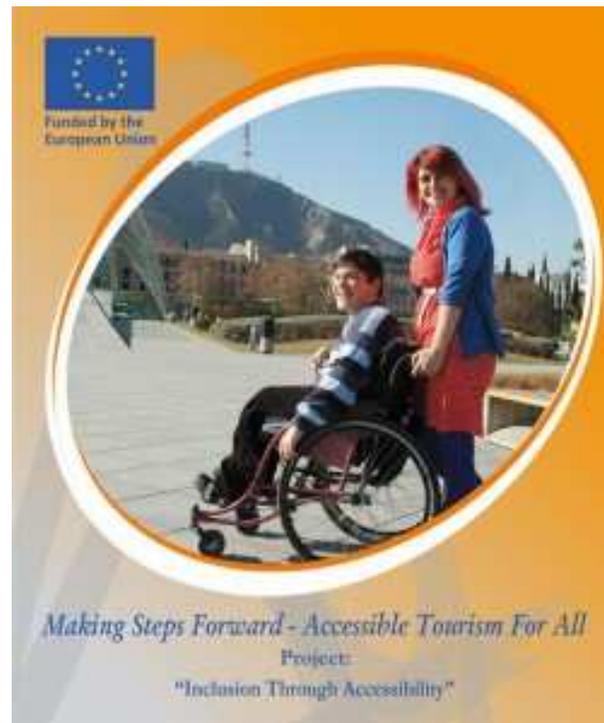
The various levels of Assemblies or Districts may also do well to consider having these schools re-designed or ones being newly-built

designed for multi-purpose uses, so as to make these bona fide public properties communally more useful and profitable as well as functionally relevant. This is what the progressive and utilitarian concept of "Universal Design" and "Modernism" are about. Of course, universal design also implies the user-friendliness of these facilities by the physically challenged or handicapped.

It is about time our community leaders and local politicians kept themselves abreast with the utilitarian tide of the times, or we risk ossifying ourselves out of positive and foresighted societal functionality. A word to the wise....

PROGRAM & EVENTS:

1.



2.

Transportation connects us all.

Whether it's simply getting from home to work or using products shipped over distances near and far, in every region of the world transportation impacts our daily lives.

At first glance, transportation may simply appear to be about the movement of people and goods. But looking deeper, it's also closely linked to equality, access to healthy food and good schools, and wildlife impacts, for example. As the mobility demands of people and freight have grown, so too has the need for products, systems, and services that will make the transportation sector more life-friendly, for both people and the planet.

Registration is now open

Learn biomimicry and how to apply it while competing for cash prizes with students from around the world.

[Register](#) your team for immediate access to the [biomimicry design resources](#) and start developing your design solution today!

3.



The Biennale Internationale Design SaintÉtienne 2015

4.

SCREEN
For a wide range of designs that are expressed on a screen, from applications to motion, interface to entertainment.

EXPERIENCE
About analyzing, designing & improving the user's experience. It includes service design, UE, UX and XD.

CONCEPT & STUDENTS
For concepts developed in any medium and design discipline, by students or professionals.

GRAPHIC
For print, branding, graphics & environmental design.

SPACES
For architecture, interiors & urban design.

PRODUCT
For 3-D, industrial & product design.

HEALTH
For any health-related design, from devices to delivery, systems to facilities.

TRANSPORT
For all forms of transportation, from cars & bikes to trains, planes and systems.

The Spark 8th Annual International Awards

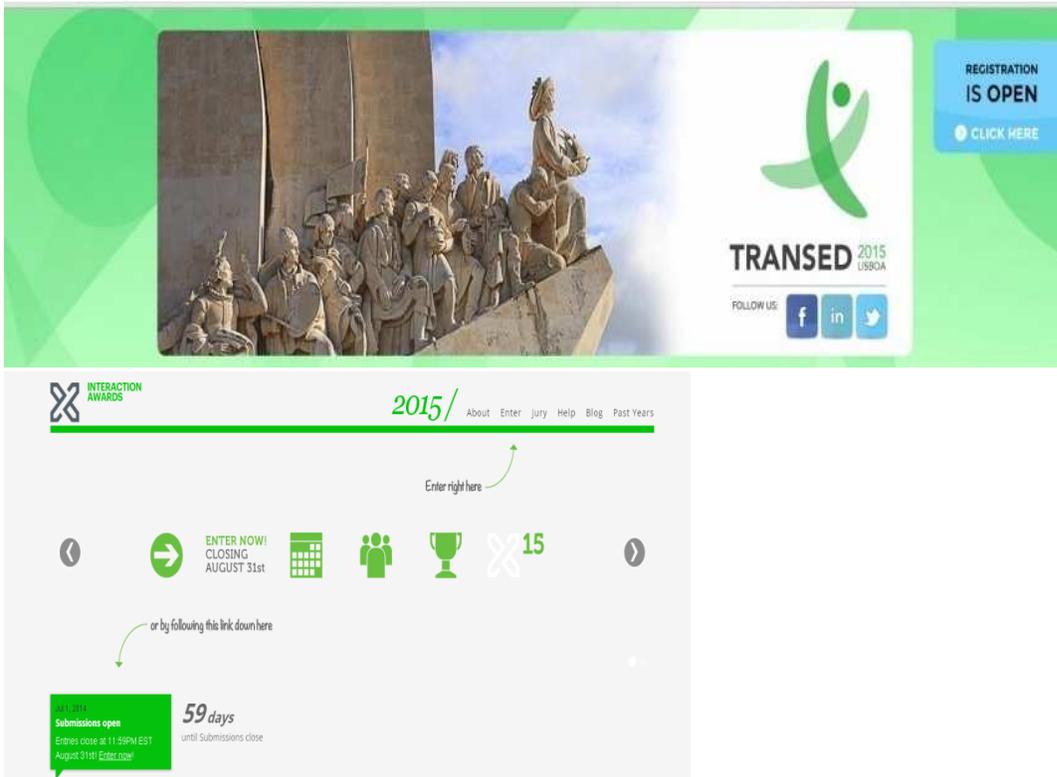
EIGHT NEW COMPETITIONS SERVING EVERY DESIGN DISCIPLINE
FOR COMPLETE DETAILS, VISIT WWW.SPARKAWARDS.COM

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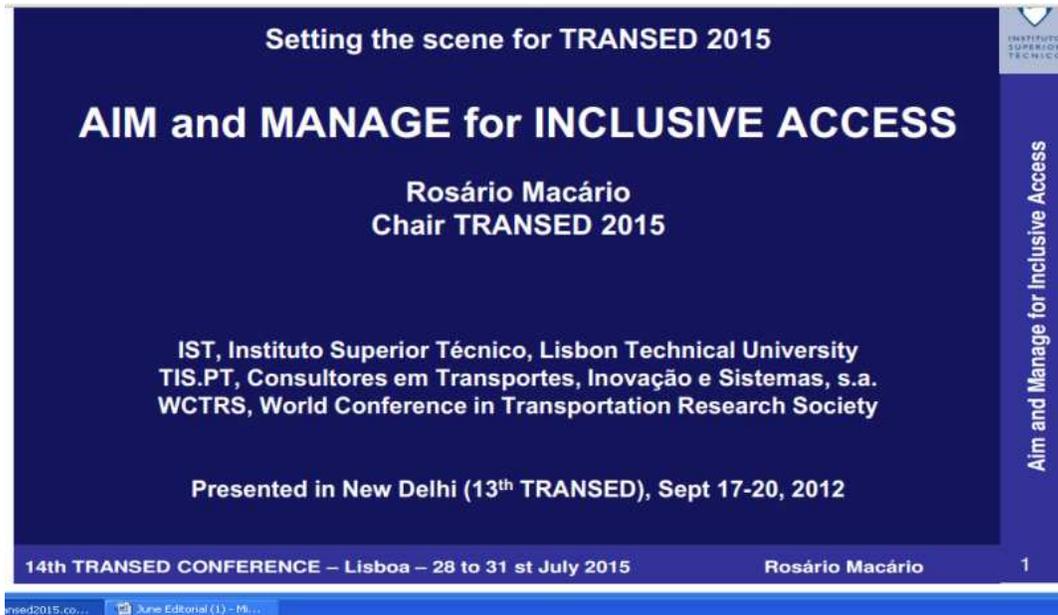
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6.



7.



8.



The voice of blind and partially sighted people in Europe

The Vision for Equality Award

The **EBU Vision for Equality Award** is given to European organisations, institutions, policy makers, enterprises or individuals in recognition of their commitment to protect and promote the rights of blind and partially sighted people and to improve their living conditions. The Award, which consists of a certificate and a piece of art by a visually impaired artist, is presented every four years on the occasion of EBU general assemblies.

Nominations may be put forward by EBU national members and are processed by the EBU Awards Working Group.

CALL FOR NOMINATIONS FOR THE 2015 EBU "VISION FOR EQUALITY" AWARD

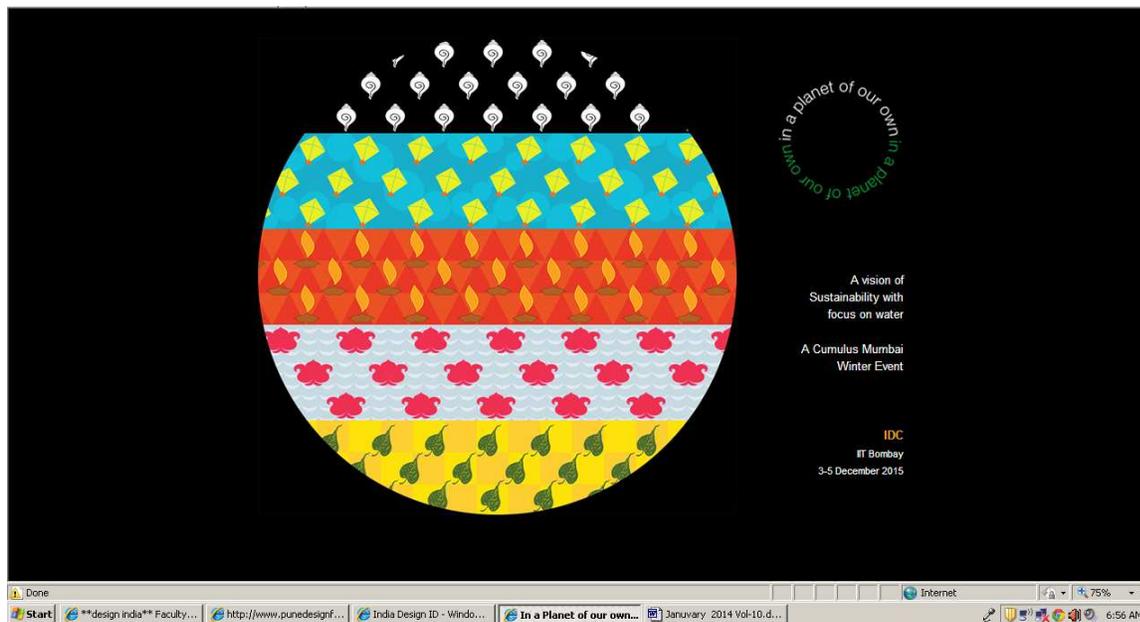
9.


ICED
2015
DESIGN FOR
Life

WHEN
July 27-30, 2015

WHERE
Milan, ITALY
Bovisa Campus - Politecnico di
Milano

10.



Cartoon Competition

We invite you to participate to showcase your ideas on sustainability during the Cumulus Mumbai 2015: In a planet of our own - a vision of sustainability with focus on water' by submitting a Cartoon created by you.

Design Cartoons on the theme of Sustainability with focus on Water

We invite cartoons which humorously communicate the seriousness of the theme, by rethinking sustainability with respect to water in terms of conservation, preservation and recycling. Rethink situations, rethink water, life, thirst, cleanliness, greenery, energy resources and everything else we use day in and day out to keep going. Rethink and depict how the saving of water that can fully give a new lease of life by either going back to nature or going back into the design process as a new paradigm that can affect our world..

Cartoonists are invited to interpret the theme of the event 'In a Planet of Our Own - a vision of Sustainability with focus on Water' as representations through designing of Cartoons.

The Winning Entries:

- 1. The winning cartoons will be displayed as an exhibition during the event. We expect the exhibition to travel to other places as part of other events.**
- 2. The winning entries will also be published as part of a book to be released during the conference in December 2015.**
- 3. Each of the winning participants will receive 5 copies of the book.**
- 4. The winning participants will also be given the 'Certificate of Winning the Cartoon Competition'.**

Partnership:

This competition is done in partnership with [Usability Matters.Org](http://UsabilityMatters.Org)

The Jury and the Judgment Criteria:

The jury will be well-known professionals and socially active personalities. The names will be announced in due course.

For judgment, the jury will use criteria such as creativity, humor, visual communication, presentation, persuasiveness, originality, cleverness, relevance of content and execution.

Submission Guidelines:

Entries : up to 5 cartoons per person

Size (hard-copy): A4 (210 X 297 mm) or A3 (297 X 410)

Size (digital): 300dpi and in dimensions of A4 or roughly 2500 x 3500pixels
Please make sure the resolution is 300 dpi so that it is suitable for printing

Technique: free - can be either hand drawn or digital using any medium

and email these with the subject line 'Cartoons' to:
contact@inaplanetofourown.net

or snail mail to:
Cartoons - in a planet of our own

IDC, IIT Bombay
Powai, Mumbai
400076
India

11.



JOB OPENINGS:

1.

Magickwoods India , is looking for a Fresher or a Junior Designer to join our facility at Chennai plant.

We are looking for someone with a great 3D rendering skill (apart from the Default requirement of a creative mind & being a solution provider). Our main products are: Bath & Kitchen furniture (and we are also looking into expanding into other related furniture category).

**If anybody is interested, pls send in your CV and portfolio to: Vincent Albert
VincentA@magickwoods.com**

+91-95000

11003

www.magickwoods.com

Tel (O): +91-44-47402900 x106

Mobile: +91-95000 11003

<https://www.facebook.com/magickwoods.in>



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