

Entrepreneurial Empowerment through Design

Case Studies of Design Projects under
Design Clinic Scheme for MSMEs

About Design Clinic Scheme

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Design Clinic Scheme for design expertise to MSMEs, is a unique and ambitious design intervention scheme for the country's micro, small and medium scale enterprises. It is an initiative of the Ministry of MSME (Government of India) launched under the National Manufacturing Competitiveness Programme. The scheme brings exposure to design thinking and processes to the doorsteps of industry clusters for design awareness, improvement, evaluation, analysis and design related intervention and application.

The objective of the Design Clinic Scheme is to enhance industry competitiveness and productivity, with the help of design intervention and application at various functional levels. The Design Clinic Scheme is structured to provide design related help through design awareness seminars, design awareness programmes and design projects. The scheme provides help through financial assistance at different stages for better implementation of scheme and design awareness. In the Design Clinic Scheme, National Institute of Design (NID), Ahmedabad assists the Ministry of MSME, (GOI) as nodal agency for implementation.

The total outlay of the Scheme is Rs. 73.58 crore, out of which Rs 49.08 crore is offered by the Government of India at various stages of implementation (upto Rs. 60,000 for Design Sensitisation Seminar, Rs 3,00,000 for Need Assessment and Design Clinic Workshop and upto Rs 15,00,000 for Design Projects). The balance amount to be contributed by the benefitting MSMEs. The scheme provides immense opportunity to a large sector of MSMEs (Associations and Units) as well as to the Indian Design fraternity.

Design Clinic Scheme aims to bring the MSME sector and design expertise on to a common platform and provide expert advice and solutions on real time design problems, resulting in continuous improvement and value addition for existing products and services. Design consulting firms, independent design practitioners, and various design institutes of the country and design students as well, can assist in the country's vast MSME sector to move up the value chain, through value addition and competitive edge of their products and services.

Message



The Design Clinic Scheme is one of the 10 schemes of the National Manufacturing Competitiveness Programme's initiative of the Ministry of MSME, Government of India, to offer design expertise to micro, small and medium enterprises for improving their manufacturing competency. The scheme was launched in February 2010 to enhance industry understanding and application of design and innovation and to promote design as a value adding activity, integrating it into mainstream business and industrial processes of MSMEs.

I am happy to note that since the launch of the scheme, we have been able to bring the Indian manufacturing sector and design professionals on to a common platform. The active support and involvement of State Governments, Industry Associations and other stakeholders has helped in implementing various activities of the scheme in 200 MSME clusters across the country. Design is now being promoted among the MSMEs as a value adding activity, as demonstrated by the design projects undertaken by the MSMEs under the Design Clinic Scheme. The benefits under the scheme have been extended to over 177 design projects, out

of the targeted 300. We still have a long way to go to sensitize MSMEs across the country on the advantage of design in improving manufacturing competency and better quality products, which can enjoy larger market shares across the globe, through design application. By the time we achieve the envisaged target, we may have a better understanding of the design needs of MSMEs to promote innovation and competitiveness.

The compilation now being published presents a valuable overview to the design process and its application among select MSMEs who took advantage of the scheme's activities. The information in there is intended to help MSMEs and design professionals understand better the design needs of a large number of MSMEs, who may come forward and seek design intervention for improving their products and services.

Madhav Lal, I.A.S.

Secretary
Ministry of Micro, Small and Medium Enterprises
Government of India

Message



The Office of the Development Commissioner (MSME) Ministry of Micro, Small and Medium Enterprises, Government of India launched the Design Clinic Scheme for Design Expertise to MSMEs on February 17th, 2010, as part of National Manufacturing Competitiveness Programme (NMCP) during the 11th Plan Period, with an overall budget of Rs.73.58 crores (including Government of India contribution of Rs.49.08 crores). The Scheme is intended to improve the manufacturing competency of MSMEs by availing design expertise.

Over the years, more than 300 MSME clusters have been design sensitised through seminars. Design needs of more than 185 clusters have been assessed to provide spot design solutions. 177 design projects by design professionals and 70 design student projects have been registered with the active support of MSMEs across the country.

This compilation attempts to give an overview of design thinking and application process of 21 MSMEs who took advantage of the financial benefits extended under the scheme. We hope this will help MSMEs, design professionals and other stakeholders among the micro, small and medium sectors to understand the need for design application in their products and processes, for improving their manufacturing competency and market share.

Amarendra Sinha, I.A.S

Additional Secretary & Development Commissioner
Ministry of Micro, Small and Medium Enterprises
Government of India

Foreword



It gives us immense pleasure to present in this anthology of the Design Clinic Scheme's (DCS) successful design project case studies, an overview of the impressive achievements, in what seemed to be an 'unreal' opportunity, presented by the ambitious DCS, when launched four years ago. The in depth exploration of experiences in each individual case study offers a realistic insight into the design intervention process, to the uninitiated MSMEs. National Institute of Design is privileged to have been associated with this project in the capacity of nodal agency.

The implementation of the Design Clinic Scheme is expected to bring about a major paradigm shift in the manufacturing competency level of the MSME sector in the country, with improved quality products. Handholding support of the office of DC MSME in this endeavour has encouraged individual MSME units to come forward and take part in developing new designs, and improve products by addressing specific design problems faced by the units and their products. The scheme's financial assistance for design projects reduces the risk of return on investment and eliminates hesitation amongst MSMEs to avail design benefits for better product positioning.

NID has been spearheading the design movement in the country for the past 53 years, having pioneered design education, research and services and is known for its pursuit of Design Excellence to make 'Designed in India, Made for the World' a reality. NID graduates have made a mark in key sectors of commerce, industry and social development by taking on the role of design catalysts and thought leadership. The initial compilation of 21 successful design intervention projects is intended to inspire Indian MSMEs to emerge as global leaders by equipping themselves with the Design Advantage Factor demonstrated for all stakeholders, in over 200 MSME clusters scattered across the country.

We look forward, with this well timed initiative of the office of the DC MSME, supported by NID to see more design enabled micro, small and medium enterprises establishing their strong presence in the national and global market with well designed products in the years to come.

With best wishes,

Pradyumna Vyas

Chairman, PIC
Director, National Institute of Design

DCS: Overview

For easy percolation of design thinking philosophy and maximum benefit for MSME units, implementation of the Design Clinic Scheme is spread into the following 3 broader areas, namely Design Awareness Seminars, Design Awareness Programmes and Design Projects. These have helped in smooth transition of design intervention advantages and process to MSME Industrial and Business clusters, through promotional and project activities.

Regional centres in 5 different zones across the country have been established for reaching the remotest MSME cluster in the county. The Regional Centres at Kolkata, Guwahati, Ahmedabad, Delhi and Bengaluru have been able to conduct more than 300 seminars and 190 awareness programmes.

The scheme has been able to generate more than 400 project applications from MSME units in the category of professional and student projects. In the sphere of professional projects, many initiatives have been undertaken in areas such as automotive products, home/business appliances, electronic and interface devices, furniture, industrial equipment, medical devices, packaging solutions, safety equipment, toys and agriculture equipment. The diversity of the targeted clusters has helped the Design Clinic Scheme create meaningful guidelines for patronising future projects.

Registration of designers and MSMEs has created a wide canvas for interaction and awareness building. The scheme has registered more than 1500 designers in the category of professional designers, design firms/houses, students and Institutes. MSME units and associations interested in participation in the scheme have registered on various occasions. There are more than 2000 MSME registrations as in March 2014.

Promotional activities like participation in exhibitions, apex body seminars, show case design, print media, circulation of brochures have been actively pursued. MSMEs awaiting designers confirmation etc are helping in connecting with MSMEs located in different parts of county. Web site [www. designclinicsmsme.org](http://www.designclinicsmsme.org) has been crucial in generating useful information and providing scheme related information, reports of seminars and workshops from time to time to designers and MSMEs.

The spread of design awareness is an uphill task in the country, with such diverse business domains and interests. Design Clinic Scheme has been able to achieve a remarkable status amongst the MSMEs in India and projecting itself strategically in the next phase of implementation, for generating breakthrough outcomes from the effort placed by the offices of the DC, MSME and NID together.

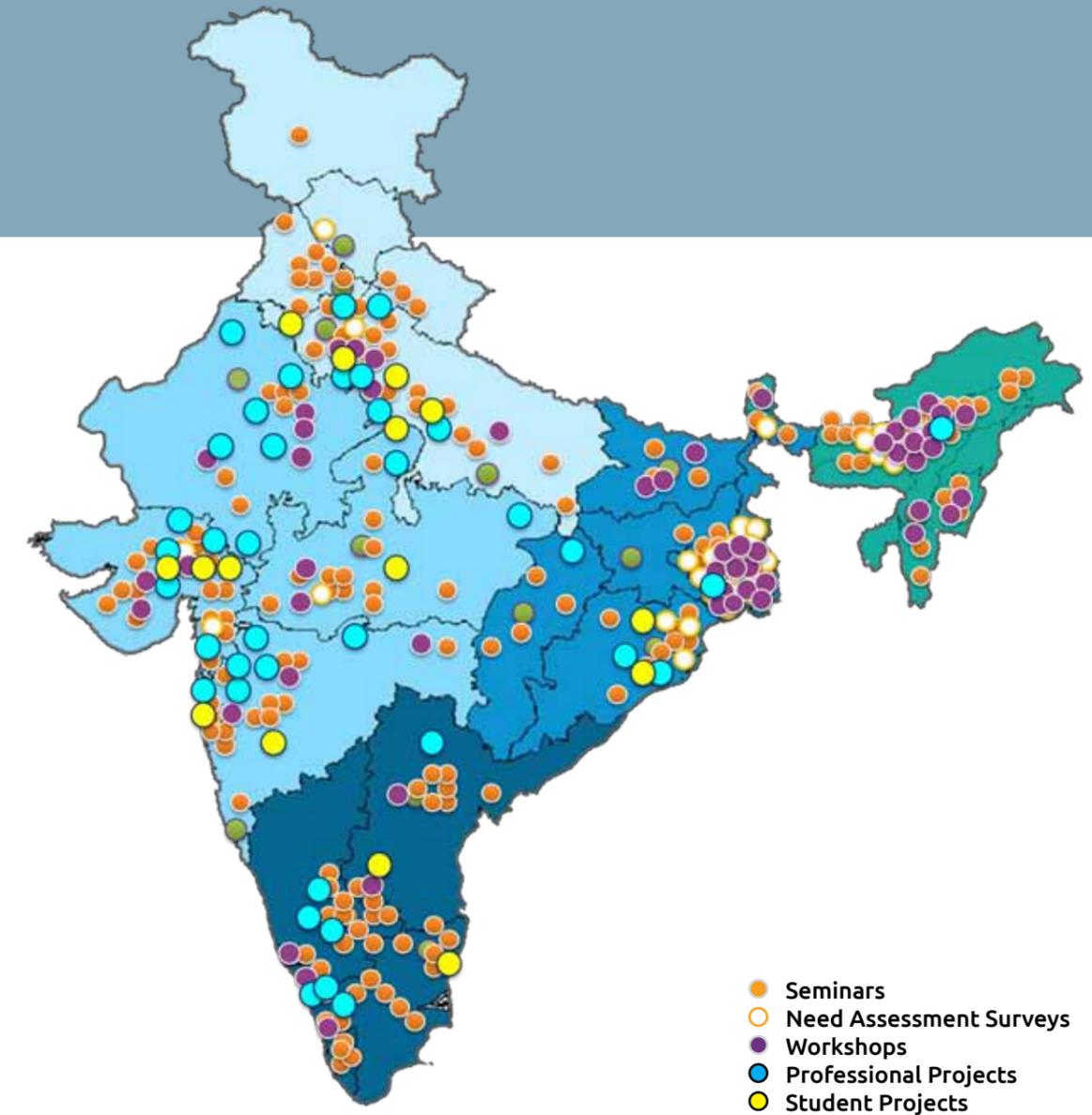
Statistical Status

Under the Design Clinic Scheme, Design Projects are playing a significant role in the implementation of design in the MSME sector. Here designers from across the country, as consultants can participate with MSME units as co-applicants for performing and delivering design outcomes. The Design Clinic Scheme has received more than 300 professional project applications, seeking design and financial assistance. More than 50 projects have been completed and approximately 25 more are expected to reach completion over the next few months. The status of application received are as per the table.

As part of design projects, student projects enable MSMEs to take up projects with design students for delivery of design in a MSME setup. Design training in institutions primarily follow a process of project based exposure that help design students learn and practice design, during the class room activity. At the end of the course, most of the design institutes create a structure of dedicated design to be taken up by students as their diploma/final year project in the

practical business scenario. The same project could be taken up as a DCS activity with financial support under the scheme. Design projects taken up by students in the industrial scenario help in continuous interaction and exploration of design with the help of manufacturers. This practice helps not only students but MSMEs as well to understand the importance and implementation of design in products and day to day activities.

Design Clinic Scheme has been able to cover following sectors under the design projects: Agricultural Implement, Auto Components, Ceramics & Glass, Electrical Equipment, Electronics Equipment, Engineering & Fabrication, Energy, Food Processing, Garments, Gems & Jewellery, Handicraft, Handloom, Jute Products, Leather Products, Machine Tools, Machinery, Medical Equipment, Metalware, Packaging & Graphics, Plastic Products, Rubber Products, Safety & Security, Sport Goods, Stone & Marble, Textiles, Toys, Wood & Bamboo, also Wood and Steel Furniture.



Professional Project Status

Status	West	North	South	East	North-East	Total
Approved	80	40	35	11	11	177
Rejected	29	14	30	6	0	104
Under Evaluation	8	5	5	2	0	20
Grand Total	127	68	72	22	12	301

Student Project Status

Status	West	North	South	East	North-East	Total
Approved	11	40	36	7	2	96
Rejected	1	8	45	3	1	58
Under Review	1	0	3	0	0	4
Total Received	13	48	84	10	3	158

Case Studies :

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	30	Metal Scrap Utility Epsilon Engineering Pvt. Ltd.	76	Educational Toys Playgro Toys India Pvt. Ltd.
	34	Lighting Fixtures Indira Engineering Company	80	Theft and Leak Proof Manhole Crescent Foundry Company Pvt. Ltd.
	38	Automatic Thrust Turning Plant Kahlon International	84	Domestic and Commercial Water Purifier Membrane Filters (I) Pvt. Ltd.
	42	Educational Aids for Children Pegasus International	88	Hand Made Home Décor Products WINDGLAZE
	48	Lighting System Goldwyn Limited	92	Craft Kits for Children Creative Educational Aids Pvt. Ltd
	52	ENT Multiscope Zandig TQM Solutions Pvt Ltd.	96	Toilet Flush Institute supported
	56	Water Purifying System for rural India Mahavir Pumps Manufacturing Pvt Ltd		

Volume Control Damper

Optimising energy, finance and comfort in the air conditioned living space



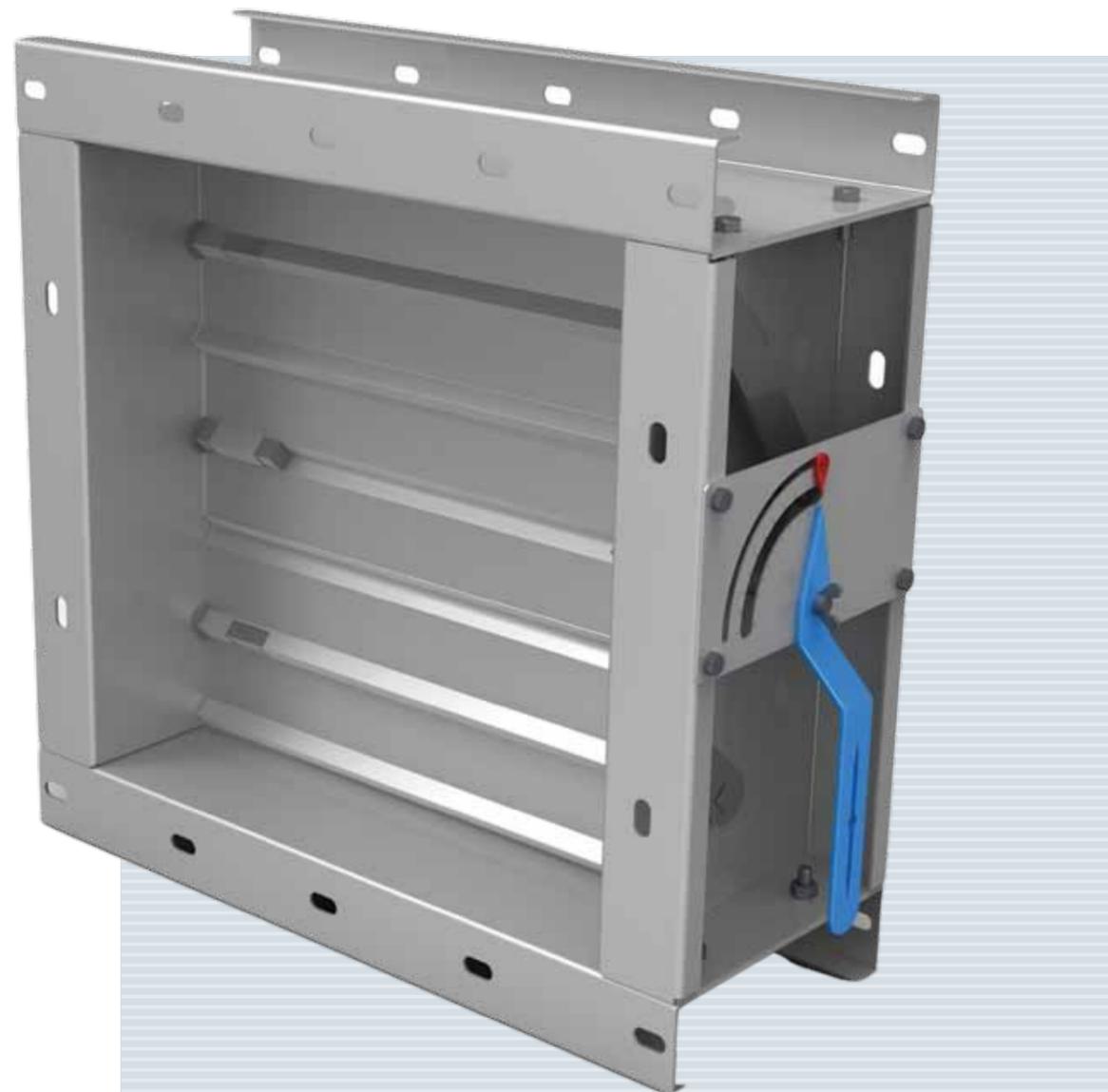
The MSME

Airpro Engineers Pvt. Ltd.
Thane (W), Maharashtra
Website : www.airproindia.com
Contact Person : Mr. Kailash Khairnar



The Design House

Design LIFE
Thane (W), Maharashtra
Website : www.designlife.in
Contact Person : Girish I Lone



The process of redesigning the existing volume control dampers entailed undivided replacement of basic manufacturing techniques like riveting and welding, by bolts and systemic process of assembly for ease of manufacturing and transportation. Opening and closing scale marks near the control lever were a new feature to enable precision and ease of control.

Left - new design with improved aesthetics, function and control
Right above - old volumetric control damper

Introduction :

In an environment conscious era, where effective use of power resources, that enhance air-conditioning efficiency through optimal use, a volume control damper is almost a mandatory feature for integrating air ducts of centralised air conditioning systems, to control quantum of air flow into specific rooms, as also to maintain the flow of air, temperature and pressure there.

Therefore the significance of a volume control damper (VCD) to control the flow of air in a ventilation and air-conditioning (HVAC) heating or cooling system. In order to improve efficiency and occupant comfort, the circulation of temperature modified air is controlled using VCD manually or automatically. Technically, a VCD is a valve or plate that regulates the flow of air inside an air duct, or other air handling equipment. A damper

installed inside the duct, may be used to cut off central air conditioning (heating or cooling) to an unused room, or to regulate it for room-by-room temperature and climate control.

The main function of the VCD is to regulate the flow of air temperature control applications, depending on specific use.

They are classified on the basis of shape and could be rectangular or circular, be manual or motorised, with aerofoil blades, flat, aperture and shutter type material of galvanised mild steel and stainless steel.

The implication of investment in enhancing the design of this significant element of the contemporary living scape, cannot be underestimated.

Says Kailash Khairnar (Chairman & Managing Director – Airpro Engineers Pvt. Ltd.), “The original volumetric

control damper had an overall crude look, which gave it a low perceived value. Besides, the time and labour consumed for assembling due to welding was not commensurate as it required powder coating to cover the welding joints. The original model moreover presented difficulty in finishing during grinding.”

Adds Girish I Lone (Proprietor – DesignLIFE), “Paucity of skilled labour for welding, grinding and powder coating and weak design in sections made it prone to denting and unwanted bending. All in all, it turned out to be a costly proposition to manufacture in terms of process, labour and energy costs. While shortcomings were evident, the specific areas for seeking design improvement were evading.”

Continues Kailash Khairnar, “There were various considerations on each part e.g. we realised that, aerofoil shaped blades are efficient and that there is a market demand for these, but they were available in extruded AL section, which made them costly. A cost effective way of manufacturing aerofoil blades was identified as a requirement. It was recognised, that the VCD needs to be lightweight and that the angle gauge should be improved in terms of manufacturing

and usability, for more accuracy and feedback also, that installation at site should be aided with the help of precut holes and installation information.”

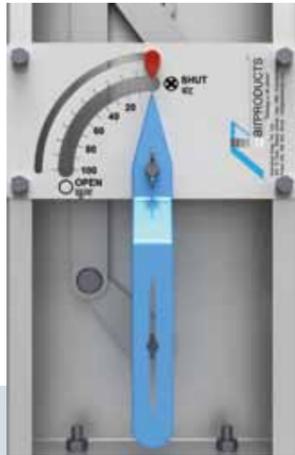
Girish I Lone elaborates, “Further it was recognised, that once the installation was done, the direction of blades was not visible to the inspecting person, who did periodic checks of systems, hence the provision for better visibility of angle gauge from the ground and indication of direction of blades. It was ascertained that the efficiency of the VCD could be improved by incorporating better materials and precision manufacturing components, where it could perform like a full shut damper or smoke damper, with additional benefit. It was preferred that the assembly be done by a single, skilled person or technician. The conclusion was that design could offer the option for up-gradation of the manual controlled damper, to motorise after installation.”

On the other areas, that needed addressing to optimise functioning through redesigning, Kailash Khairnar identified, use of corrosion resistant materials, replacement of welding with suitable joining processes, imposition of guides for enquiry precision and accuracy by following activity on one point and in that, optimising

production time. Additionally, it was realised that straightening channels could make them stronger and dent resistant. Finished edges and filleted corners were required to ease use with the introduction of the new production process and material, which offered a huge advantage in a highly competitive, cost driven industry.

On the Branding Design aspect, it was suggested, that the product carry the Airpro branding at various touch-points to enhance brand recognition. It was also recognised, that primary packaging added more value to the product from the customer’s perspective and therefore helped to enhance the brand image.

Design LIFE being experienced in designing a wide range of products including home appliances, engineering products, medical devices, hand and machine tools etc. provided an opportunity to think creatively and address the problems of new products. Airpro Engineers Pvt. Ltd. on the other hand, had experience in manufacturing engineering products. They were looking for a break through solution in the area of simplifying manufacturing process, packing and storage along with onsite assembly, controls, service and maintenance, keeping the existing functions of the products unchanged.



Right – assembly of new design discussion during prototype for ease of manufacturing old process of welding, riveting and finishing



Design Objectives :

Says Girish I Lone, "The focused sections for redesigning were identified after in depth research and discussion on issues related to manufacturing and assembly in terms of quality, usage, installation and reducing assembly time. Hence manufacturing cost, acclimatisation to contemporary style and equipping with higher perceived value, were considerations it was decided to move with. A more finished aesthetic rather than crude look, selection of better materials, improvement of manufacturing processes, enhancement of aesthetic appeal of the product through use of innovative materials and finishes and implementation of innovative designs to surpass competition, were considerations."

All this basis an understanding of the product and its engineering aspects, where basic criteria like target audience and manufacturing constraints were considered.

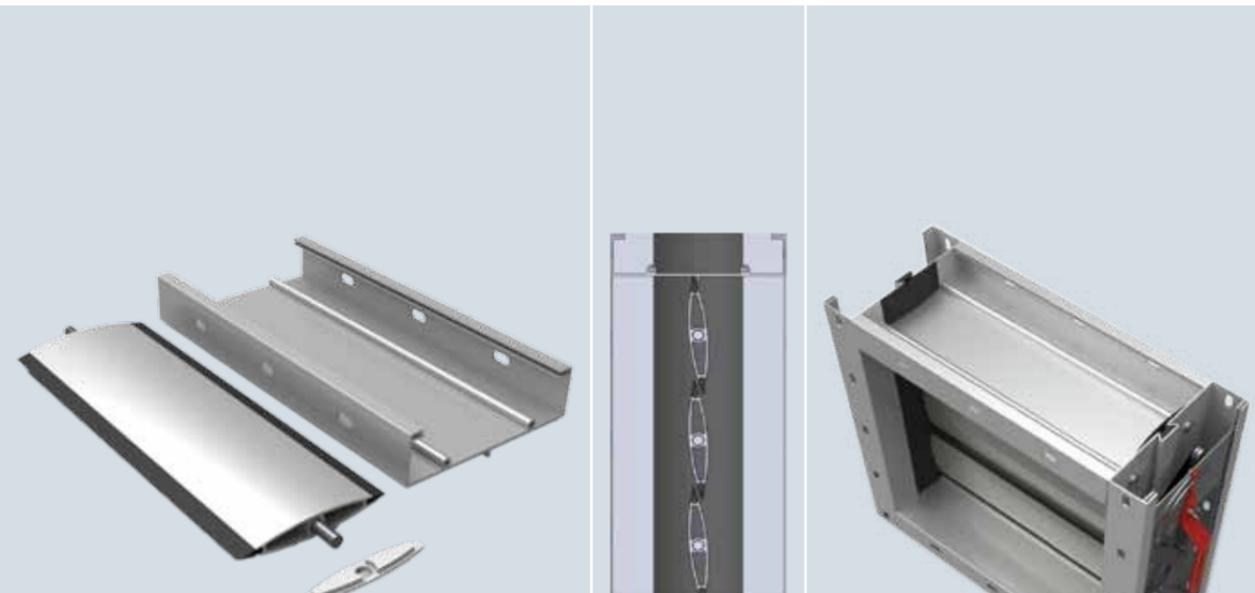
Design Journey :

Design LIFE moved in a phased plan for the preparation of the redesigning process of the volume control damper. In phase one design research was the focus, where a "self search" for understanding the client's vision and long term goals with respect to this project and current product analysis was conducted. This was followed by phase two or concept generation stage. Phase three included concept refinement and then phase four where prototype development and

evaluation took place, with the final phase five where refinement and final engineering presented the concluding segment of design preparation.

Says Kailash Khairnar, "The redesigning, included bending of channels and blades and assembly of structure with welding, as the main joining process. Grinding of welded joints and powder coating and finally cling wrap, before readying for despatch were the other processing."

Right - CAD model and rendered image for pre approval.



"Besides," continues Girish I Lone, "the 1.5 mm thick triple "V" groove blade profile, gives maximum strength. The additional blade seal is attached within the blade, to create low closed blade leakage with aluminum aerodynamic profile blade, leading to low noise generation, critical smooth flow and low leakage for increasing efficiency of the device."

Way Forward :

With the manufacturing processes and joining method having been proven, this concept can be implemented, in the manner conceived.

According to Girish I Lone, "The design is being implemented by the client now, rigorously in the manufacturing process. It enjoys good cost reduction with respect to the earlier design, material use, manufacturing and finishing processes. As the design also encompasses clear branding, it increases the brand value of the MSME."

Right - design for complete solution, product, manufacturing, packaging and logistics



The Advantages :

Says Girish I Lone, "The improved design of the volume control damper has good strength, with least chances of denting. It is well finished, clean, with a strong design persona that builds confidence and good brand value. It is easy to assemble without the need of welding. There is no need to paint or powder coat, unless required by the client, or to give a special finish to the product. Besides, bolting or VHB, it allows fast and easy assembly almost like a DIY process. It encourages saving of power bills and energy with the elimination of welding and does away with the requirement of skilled welders on expensive and scarce resources of time consuming labor for grinding, finishing and clean-up for powder coating, giving strength through clean and straight edges, be showing manifold superior aesthetics in comparison to original products. A neatly designed angle plate with the client's branding gives it a more reliable image in the market, generating confidence and brand recall. Moreover, introduction to new material and processes like pultrusion makes the design light weight and stronger with a unique proposition offering to the end customer."

Sums up Kailash Khairnar, "These steps led to saving energy and labor cost, resulting in production processes becoming faster and efficient, saving money and time."

"Besides," says Girish I Lone, "It offers ultra lightweight assembly, highly efficient blade profiles, complete shut-off type damper, smoke damper, sections with provision for bolting, hence faster to assemble with minimal training. A variety of colours are possible within the process making it a single person process."

Visitor Management System

An all encompassing security and human logistics record maintainer



The MSME

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Pune, Maharashtra
Website : www.scrum-system.com
Contact Person : Amol Deshpande



The Design House

Aakruti Consultant
Pune, Maharashtra
Website : www.aakruticonsultants.com
Contact Person : Dhananjay Shahane



Left - old product assembled computer with visitor management peripherals

Right above - new product, a complete knockdown visitor management system

The Visitor Management System is an amalgamation of a complex set of computer programmes, with a plethora of peripheral devices like webcams, visitor card scanners etc, which individually pose a major challenge for training as well as maintainance. The original model called for a dedicated operator for handling the system, which made it a costly affair.



Introduction :

An efficient Visitor Management System (VMS), is an incredible asset to effective functioning, for tracking the usage of any public space, office building or site by visitors. By gathering increasing amounts of information, a Visitor Management System can record the facilities accessed by specific visitors and provide documentation of their whereabouts. It allows security personnel to check credentials of individuals and allow them to access secure areas of operation, with minimal threat and hazard, serving a wide gamut of surveillance and office requirements from front end lobby, to temporary labour management and attendance services.

Says Amol Deshpande (Director & General Manager – Scrum System Pvt. Ltd.), “Most of our customers are multi-nationals comfortable in plush ambience with exemplary architecture and interiors. Our product installation elevates the benchmark of an organisation to world class. We are catering to some developed markets like Singapore and Dubai and hence need to have an internationally acceptable product.”

Continues Dhananjay Shahane (Principal Designer – Aakruti Consultant), “The earlier units were used under strict control of the Indian Government, for surveillance and visitor tracking. Later, to explore its commercial viability, where looks and overall product design aspects were justified as having more importance over functionality. Hence, there was a need for design intervention. No such product is available which is tailored for emerging market needs where security, absenteeism, physical presence and authorisation to access or enter the site is possible.”

Scrum System Pvt. Ltd. is a solution providing company, that specialises in enterprise product development, also security and systems software. Aakruti Consultant, a product design and development firm, focuses on providing Design and Strategic Solutions to their own country's budding micro and small entrepreneurs, who have potential ideas, that take cognisance of current global market trends.

Design Objectives :

Says Dhananjay Shahane (Principal Designer, Aakruti Consultant), "We wanted to redesign the Visitor Management System, to make it simple and easy to use, offering quick solutions for visitors to corporate offices. We wanted to target response time to less than 1 minute, reduce queue up time and enhance the quality of experience, primarily in a corporate environment. This, further accentuated with the use of corporate colours mostly in lobbies, reception areas, security gates, canteen and other privileged segments, within the company premises. The additional objective was to allow an individual to create their own badge by clicking on the options provided. Redesigning was also undertaken to improve work efficiency and applications such as Labor Management."

Design Journey :

The planning entailed an inclusive approach with industrial design, styling and prototyping, with a focus on limited volume production. In phase one, namely Design Strategy, they understood user scenarios and field problems. Here they viewed colour, look and feel to enhance product aesthetics and undertook similar global product mapping and research, understanding the functionality of the product and accordingly deployed design strategy and directions. In phase two, to determine styling treatment, 2-3 concept sketches of initial rendering decided direction. A mid phase meeting was coordinated to determine two directions and final design short listing. Also proof of concept of

3D max virtual prototype of two concepts was finalised. During phase three, prototype drawing and 3D CAD visualisation were the key focus with FRP prototype and proof of concept determination. In the fourth and final phase, fifteen units of limited volume production were undertaken with documentation and drawings.

Recounting Dhananjay Shahane says, "We created a new sheet metal enclosure with laser cut, that had a clean look and accuracy of 0.05mm, with new elements including tray from printer paper loading (sliding tray), scanner fitment in enclosure (positive locking to avoid transit damage) and a camera fitment for an integrated look. Also we redesigned the packaging based on volumetric weight of the courier industry."

Says Amol Deshpande, "The redesigned version incorporates all the essential hardware inside a secured console and provides touch screen and camera based input device for entry of visitor information. The new device has a bar inbuilt printer and code reader to make the system operator free." Previously, the Visitor Management System was assembled from off the shelf purchased computer accessories, more like a bread board model with an individual sub system, separate like – camera, printer, monitor and figure print scanner. The new design is a single piece, where all the gadgets are assembled in to one enclosure and can be displayed on the reception desk and in company lobbies.

Way Forward :

Summarising, Amol Deshpande says, "The new redesigned model of the Visitor Management System has five demo units, that customise software applications as per client needs. When compared to the older version of the product, we have benefited in terms of volume having produced 200 numbers of

the redesigned version, as compared to the original number of 75. The new design has helped in improving the sale turnover by 50% and augmented profits in the last financial year by 10%." Further, Amol Deshpande continues, "Being an MSME, makes budget a constant concern. Because of Design Clinic Scheme, we were able to invest in design, produce a great product and have been able to inculcate the culture of 'Product Design' in our organisation."

Elaborates Dhananjay Shahane, "Cricket World Cup 2011 was a mega event which took place at Wankhede stadium. Due to the high profile dignitaries attending this event, special security arrangements had to be provided. The Mumbai police who was responsible for this event, chose LabourworksTM – a biometric enabled system to profile and generate IDs for various agencies involved in providing the security. With LabourworksTM, essential details like photograph and finger print (biometric signature), were captured and badges were generated. Around five thousand badges were thus created and the system was found to be very useful."

Right - operator free visitor management system with features like touch screen, biometric sensors and bar code printer.



The Advantages :

Adds Amol Deshpande, "The redesigned version's bar code and touch screen are user friendly and simplify systems operation, making it easy even for first time users. Besides, the Visitor Pass is created within 30 seconds and costs less than 6 paise. All these factors have facilitated better market intervention." It is possible to maintain pre-set appointments in the kiosk, so that visitors do not have to add relevant details. The kiosk can also provide directions to the visitor, which can be downloaded as a SMS text message.

Continues Dhananjay Shahane, "The printing technology complements the short duration usages and follows an appointment based system, that dispenses email invites to visitors, generates reports where visitors and employers leave the premises, give directions and create instant employee badges with photograph and thumb print recognition." Sums up Dhananjay Shahane, "It's a great looking product, we have come far from where we started - It required a high amount of effort and commitment from our side. Keeping the design fee to a bare minimal, can't offer sustainable models for such projects, the financial support through the scheme thus formed a crucial and catalysing factor." Interestingly, the cost of the original and redesigned product remained at Rs. 1 lakh, for both versions.

Continuous Ice Cream Freezer

Creaming up the ice cream experience



The MSME

Synergy Agrotech Pvt. Ltd.
Ahmedabad, Gujarat
Website : www.synergyagrotech.com
Contact Person : Dilip Sarda



The Design House

Platypus Designs Pvt. Ltd.
Gandhinagar, Gujarat
Contact Person : Prakash Vani



Left - New design of continuous ice cream freezer
Right Above - old product from Synergy Agrotech Pvt. Ltd.

Design plays a very important role not only in creation of new products and processes but also helps in improving existing systems. Products serving their users sometimes need to take a relook at their functions and features, to remain competitive in the present context.



Introduction :

In a scenario where ice-cream enjoys the status of "First Dessert" and universal popularity as a refreshing fun food the world over, the significance of an ice cream freezer cannot be underestimated. The size of the ice cream market in India has been estimated to be around Rs. 2,500 crore and is expected to grow by 25 per cent this fiscal year despite a lesser profit margin. The growth is directly related to raw materials, machines and production capability of manufacturers and therefore the role of Indian ice cream machines is very crucial in achieving the quality, production and sustainable profit margin for makers of ice creams.

Similarly, Synergy Agrotech Pvt. Ltd. while redesigning the existing ice-cream freezer machine with a capacity of 100-400 ltr, realised that the new design can help make all their earlier machines more efficient and attractive.

Says Dilip Sarda (Director - Synergy Agrotech Pvt. Ltd.), "We are a leader in the market with commendable client trust on the reliability of our product. The landed cost of our product may be higher, compared to others due to excise and taxes leviable. Since our ice cream freezer is focused on small and medium scale production of quality ice cream, with a good market potential, across the industry in towns and cities, supported with an established reputation for quality, we thought it was the only logical route to enhance aesthetics and retain the lead."

Platypus Design Pvt. Ltd. is a design consultancy firm, led by a team of industrial designers. It has an in house prototype making facility in varied materials including wood, metal, plastics, stone, ceramics and textile weaving. The main focus is on optimisation and experimentation.

Set up in 1994, Synergy Agrotech Pvt. Ltd. is a full fledged manufacturing company that commenced operation in 2000. They are a leading manufacturer of plant and machinery for ice cream projects and

developed a continuous ice cream freezer indigenously for the first time in India, with more than 800 installations in India and abroad. Energy efficient, reliable machinery at an affordable cost is their forte.

Design Objectives :

Says Prakash Vani (Director - Platypus Designs Pvt. Ltd.), "The specific areas where we proposed to bring in design intervention included the chassis, fine tuning of component arrangement, grouping of controls and information display also airflow for the electronic switch box. Leakage disposal from the cylinder, component drying, better communication of instructions, operational ease, good aesthetics and regular periodic maintenance of the machine were some of the identified areas."

The Design Journey :

Encapsulates Prakash Vani, "Our end objective in each phase, was to propose the redesigned layout of the components and get validation of feasibility of the new arrangement, revise the design of chassis and cabinet covers, redesign the front cover and display control panel, make the prototype and finally to submit detailed design drawings."

"Essentially," he continues, "We worked on giving the machine a distinct personality. In the redesigning process, all controls and process information was brought to the front, a well defined display control panel was standardised for all models, so the operator did not need to open the machine. Any leakage of cream could be immediately identified and the splashguard prevented the inside of the machine from getting dirty."

Adds Dilip Sarda, "Cost saving was incurred in the chassis, cabinet, packing crate and transportation, also standardisation of cabinet covers reduced inventory. The possibility of an in house cabinet fabrication offered excise benefits, improved performance of the machine and proper air flow in the electronic switch box, prevention of entry of roaches, rats and insects. It presented dedicated space for drying of components, after each cleaning, thereby preventing loss of small components and damage to machine."

Summing up he says, "As such there were no major challenges, apart from may be two, namely convincing the engineering department that chassis weight can be reduced, without affecting the stability of the equipment, which was subsequently proven, after making the working prototype and acceptance of control panel from engineering plastic, instead

of traditional use of stainless steel, where form and function came together seamlessly, every part contributing to the whole, in a way that is inevitable."

Way Forward :

Says Dilip Sarda, "A core discovery was that our engineering and production team realised the advantages of design thinking, even in a hard core engineering product, which I am certain will manifest into a significant long term development for us. We will introduce the new range of energy efficient continuous ice cream freezers with a scroll compressor next season."

Recapitulating, Prakash Vani says, "We are happy with the outcome of the redesigned version of the product. It is unique and comparable to the best available, that will enhance their experience with the international benchmarks."

Right - old machine,
New machine with Improved
arrangement of internal components
Final product in production



The Advantages :

Says Dilip Sarda, "By redesigning the inside arrangement of the components, multiple results were obtained, namely reduction of weight, size and inventory, ease in maintenance and overall cost reduction. Components which were otherwise inaccessible for thorough periodic cleaning were made easily accessible. The chassis was designed from SS pipe sections instead of sheet metal fabrication. This resulted in cost reduction, better inventory control, possibility of in house fabrication instead of depending on a vendor, with multiple advantages. Besides an established, better quality cost reduction due to MODVAT in excise, apart from cheaper and stronger sections."

Adds Prakash Vani, "The modular design of the cabinet made it possible to keep the cabinet covers ready for use for various capacity models. The new control panel design gives a unique aesthete, that sets it apart from other dairy industry equipments that have a well designed communication system, which can prevent a few avoidable maintenance calls. Besides heat dissipation of electronic gear is another positive outcome."

Summing up Dilip Sarda says, "Our estimates of advantages that are expected to accrue from the redesigning of the old ice cream freezer are as follows : It is expected to save material cost on fabricated components by 15%, reduce assembly time by 20% and maintenance cost and time by 20%. Besides 30% reduction in weight of the chassis and cabinet covers and 20% reduction in the volume of the equipment. The condenser cylinder can be opened from both ends, facilitating thorough cleaning, where maintenance is faster and more efficient. Furthermore, it is compact, saves space, material and is easy to assemble and maintain, besides being user friendly."

Bottling Vision Machine

An improved, versatile, safe, aesthetic, cost effective version



The MSME

Duravision Systems
Pune, Maharashtra
Website : www.duravision.in
Contact Person : Kishor Durve



The Design House

NEODES
Pune, Maharashtra
Website : www.neodes.in
Contact Person : Abhijit R Takale



Left - new design with impressive aesthetics and features
Right - old bottle vision machine.

Automated, vision based on-line inspection systems ensure improved inspection, increased throughput, reduced inspector fatigue, with enhanced quality and consistency of inspection. However, these systems have been prohibitively expensive so far. The recent burst in proliferation of vision systems has helped bring down the cost of components used in them.



Introduction :

With the increasing demand for processed food, medicine and liquor, the requirement for sophisticated food packaging systems from these industries has increased manifold, especially owing to awareness of higher product quality and health standards in the food packaging sector for bottling. Advanced automatic systems are required by the Indian packaging systems. The critical pre packaging inspection of glass bottles saw manufacturers largely dependent on imported machines, as the Indian counterparts were perceived as less efficient and technically not at par in comparison.

Duravision Systems has been manufacturing bottle vision machines installed in Indian food processing industries. The requirement for up gradation of the machine has been pressing. Being driven by the increasing demand for a more precise, faster and competitive version, the MSME unit partnered with NEODES for design and technology intervention, by targeting the creation of a substitute for importing and value adding to the existing model of the glass bottling machine, that is more versatile, efficient, aesthetically appealing and cost effective.

In the Beginning :

Kishor Durve (Owner Duravision Systems) reflects, "Aware of the design process and its long term benefits, we had been keen to take up with NEODES the redesigning of the glass bottling machine for over a year, but were not in a position to bear the cost of investing in design. The price of the machine was Rs.20 lakhs, while the new redesigned one was projected to be sold at Rs.40 lakhs. The aesthetics and design of the old machine did not justify the steep cost and therefore urgently required face upliftment and technological upgradation."

Continues Durve, "We took pride in our stand alone position as the only company in India, manufacturing state of-the-art glass bottling machines, for bottles used in the food processing, pharmaceutical, cosmetics, wine and liquor industries."

Abhijit R Takale (Founder & Director - NEODES) says, "What makes this product so relevant, is its versatility in detecting defects on the assembly line before filling the content, which can't be identified using any visual

inspection method. The defects include 'bird swing' (thin glass wires present in containers), glass burr, cracks and geometrical defects which lead to leakages etc. Also, we learnt through discussion, that the large volumes and wide variety of glass bottles produced in modern bottle manufacturing plants preclude manual inspection. This necessitates automated inspection to detect defects like metal and stone inclusions, air bubbles, folds, non-uniformity in height and shape and dark spots in the bottle sidewalls."

Adds Kishor Durve, "The significance of defect detection lies in that visual inspection is not adequate for detecting defects. Aberrations like glass residual and burrs during the manufacturing process, could go into the stomach along with packaged food and other routes like medical liquid and lead to fatal internal injuries. The bottling vision machine takes care of this critical aspect."

critical dimensions and 2D part draw up, ready for mould design. It was also the time, when NEODES identified potential vendors for further sourcing. In the final phase four, they created the alpha prototypes.

Elaborating further Abhishek Kulkarni (Designer – NEODES) says, "Some of the features, we worked on to enhance design advantage in the existing product included the use of dark film on the front, to help cameras work more efficiently and give the machine a modern look, a front door access to the interiors, which offer more accurate, precise and faster processing in terms of bottle inspection. A common mould in the front and rear, saved cost by Rs.50,000/- (i.e. half), where the same machine can be adopted for different bottle and conveyor sizes."

Way Forward :

Kishor Durve summarising the outcome of the Design Clinic Scheme effort says, "One prototype production was supplied to Piramal Glass Ltd. in Surat, a manufacturer, packager and supplier of bottles. It was expected to enhance the commercial viability of the project in relation to manufacturing and other relevant industries. Design has played an important role not only in terms of improving the function and aesthetics of the glass bottling machine, but has also helped in improving our strategy to cater to the domestic and international market. With the new design, the machine is better presented in international markets and we are now more confident to take up bigger challenges in terms of improving existing products and introducing new ones into the market."

Design Objectives :

"The objective in the re-designing of the glass bottling inspection machine was to make it look modern, cost effective and resolve critical details, enhance efficiency and help establish a design language for Duravision Systems, to enable it to compete with international players in every respect. The design to be targeted was one that could ease manufacturing and assembly of all parts and at the same time improve aesthetics to demonstrate right value of the new generation technology."

Design Journey :

NEODES created a phased plan for this design project, in which during phase one, or the research and competitor study stage some interesting user task analysis observations emerged. In phase two, design concepts were frozen and they moved into working

on detailing of the product, where they addressed accessibility issues for maintenance, mounting details and 3D modelling, besides additionally exploring the new design use in single cost cutting manufacturing processes, eg. enhancing camera technology. Phase three was essentially the engineering design activity which saw them graduating to the specifics of freezing

Right - scaled down mode, prototype process of DBV machines and machine installed with running conveyer



The Advantages :

Summing up the advantages Shrikant Gundu (Application Engineer - Duravision Systems) says, "In the original machine 120 minutes were needed to fix the 4 cameras, in the re-designed machine it takes only 30 mins to fix 12 cameras, which results in a more thorough inspection. In the redesigned model, defects as small as 0.3 x 0.3 mm are easy to detect. It is also simpler to switch bottle types with low setup change time, catering to bottle sizes with diameters from 16 to 26 mm; height 35 - 55 mm, with a capacity for inspecting bottles at the rate of up to 400 bottles per minute. Reference the software, the highlights are flexibility for quick set up of new bottles, display of defects on screen, view of recently failed bottles, generation of reports on shift-wise, web support, camera wise defect image etc., which in turn makes the workers' job less stressful."

The other USPs that have emerged with redesigning include use of locally available high impact composite material, that enables less sophisticated manufacturing processes, without compromising on performance. With lesser number of manufacturing steps, the business house achieved a lower bottom line and higher margins. The geometric form conveys robustness, reliability and speed! The subtle curves lend DBV12™ an air of authenticity. Also, the choice of white, grey and large transparent surface conveys the high-tech DNA of the product, as does the emphatic typography.

In a nut shell, simple design intervention has led to increased margins for the client and enhanced perceived value for the product.

Metal Scrap Utility

Enhancing sustainability in daily living

The MSME

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Gandhinagar, Gujarat - 382044
Website : www.epsilonengg.com
Contact Person : Nagesh Gupte



The Design Student

Nitish Maurya
Product Design,
National Institute of Design,
Ahmedabad



Left - new LED solar lamps,
value out of metal waste

“Demand of energy supply is overriding the current power production capacity. The scope of solar light is very bright in India due to the fast pace development of the country, advent of advanced lighting solutions, falling prices of solar technology and increasing support from the government.”

Introduction :

The recent fast forward in evolution within our country in terms of technology, transportation, infrastructure and current urban planning, demands more energy for development. Our country has suitable conditions for harnessing solar power and the design process is increasingly looking at issues of security, maintenance, performance and aesthetics to make it a more efficient and eco friendly product.

Epsilon Engineering Pvt Ltd was setup in 1991 by a group of first generation entrepreneurs, with a focus on servicing the Telecom and IT industry. In the early nineties scenario, they concluded that the emerging Telecom/IT industry had a requirement of enclosures, where quantities could be as low as a single unit piece, yet subject to stringent tolerances and appearances.

Says Nagesh Gupte (Director - Epsilon Engineering Pvt. Ltd), “Reference electricals, it was decided to make it into a standalone unit to run on a 35 watt solar panel,

where the luminary was to comprise 83 watt superflux LEDs that provide white light (around 1200 lumens). The power source was to be 12 volt 26 Amphr lead acid battery, placed in a well protected and ventilated box. The major segment that was finally used for the product from waste metal, as we envisaged it was the real estate and private property owners in the local area, who could extend to include nearby village areas after mass production.”

Nitish Maurya, student in final year of product design, initiated discussion with Nagesh Gupte about the possibility of taking up development of products from metal scrap, as their design project for their diploma and found the opportunity of funding through Design Clinic Scheme, an encouraging possibility to take forward. Nagesh Gupte sensitised them to the existence of a pile of very high quality alloy scrap material going very cheap and gave them direction, by guiding them to create finished products of utility.

Design Objectives :

Says Nitish Maurya, "Our brief was to design a solar street light, envisioning the benefits of reuse and non-conventional energy source, through large scale utilisation of mild steel and aluminium scrap generated at Epsilon Engineering Pvt. Ltd., that could be mass manufactured, by using in house production techniques of the company."

Adds Nitish Maurya, "For the greater part, material identified for use was mild steel 2062 scrap, for most of the skeleton components, except the pillar. The fixture components were to be made out of aluminium 4032 scrap."

The major processes to be used for manufacturing the solar street light, included shearing, turret punching, laser cutting, tapping, bending, MIG welding, grinding and powder coating."

Design Journey :

Says Nitish Maurya, "Before moving into the actual design activity, the following basic inputs were taken cognisance of namely, assembly component drawings in any form, scanned paper drawings, 2D files, solid models, machine specifications, tool lists, preferred sheet sizes and weekly schedule.

The final outcome of the process was identified as including the submission of technical drawings, 3D modelling, physical prototype and user manual."

Adds Jayant C Sampat, "In the new designed mild steel light fixtures and powder coated fixtures, it can be fitted to the bracket with the help of clinch nuts, with a four sided view for road crossings. The panel will be on top of the mild steel power coated pole.

The fusion concept creates a combination of smooth and aggressive shapes, giving the entire form a distinctly contemporary look. The presence of the circular perforations makes the air passage easy, without affecting the entire mass of the fixture".

Way Forward :

Recalls Nitish Maurya, "It was an entirely a different kind of experience for me to move into the company with a typical design brief. I was expected to materialise concepts basis use of scrap of the post production stage at Epsilon Engineering Pvt. Ltd., which was very complicated indeed. From this project I earned a learning that other than the usual business process of the production industry, how efficiently it utilises the resources in its possession."

Continuing he says, "As a designer, I am very satisfied with the final outcome of my effort, during the diploma duration. There were numerous opportunities to enhance my individual product design and entrepreneurship capabilities at their best possible level. Other than the main product, it was enjoyable to create small scale utility products from scrap as well."

Emphasising further Nagesh Gupte says, "This product will be very inspirational for similar industries and the design will open a new horizon towards the use of the left-over material in any such industry, under a properly planned business model."

For the company, SOLARIDE will assign it the stature of a pioneer project in the reuse strategy and promoter of eco-friendly/ green design, on a wider scale. It will also inspire future designers for deriving utility under the same scenario."

Sums up Nitish Maurya, "The design process is very crucial for MSME units like Epsilon Engineering Pvt. Ltd. It will provide a great scope of business in the new direction and act as a trigger for the micro, small and medium scale industries in India, to attain a global recognition in design. Also, it will open more job opportunities in the respective fields. A good design methodology will make such enterprises perform efficiently in production."

Advantages :

Says Jayant Sampat, "In the redesigned product not too much maintenance is needed except for battery replacement, after the defined period and dusting of the solar panel, depending upon the dust conditions. It is very effective in terms of better utilisation of waste, with minimal involvement of machinery. It is cost effective in terms of material use, ease of installation, low maintenance, clean look, secure systems, robustness and comparability with the European design style."

Adds Nitish Maurya, "In the same vein, like the flower petal, reflects a progression of the structure in a geometric pattern, eventually, the present form expects to establish a symphony with nature, despite its presence in an urban scenario and in accordance with modern technology."

Elaborates Nagesh Gupte, "The mild steel pole and bracket stand welded to the pole. Here the panel is at the top and the mild steel top plate of the fixture stays powder coated, while the perforated powder coated aluminium light frame is made by laser cutting and bending stays fixed by clinch nuts, with a four sided view for road crossings.

Keeping in sync with the dynamic shape of the light overall structure, the light fixture is designed to withstand wind and other natural harmful elements. The sleek shape of the bottom frame helps to spread the light in the dedicated area. There is an assertion of technicality in this structure, with the gentle play of light giving an illusion of a reptile."

The designs of Solaride by Epsilon Engineering Pvt Ltd., Gandhinagar and by Nitish Maurya have been honoured by the prestigious I Design Awards as Runners - Up in the Lighting Design Category.

Right - rendered image of lamp structure, installation rendering and other iterations from waste metal



Lighting Fixtures

Enhanced attractiveness in lighting systems



The MSME

Indira Engineering Company
Ettumanur, Kerala
Contact Person : Mr. C. K. Jaya Krishnan



The Design House

Alcubis Design Solutions
Kottayam, Kerala
Contact Person : Elizabeth John



Left - new designs of decorative lighting systems

“According to a recent research, the lighting fixture market is set to grow at a rate of 17 percent CAGR till 2018, giving domestic companies in this segment a bigger opportunity in the Indian market. The report ‘India Lighting Fixtures Market Forecast & Opportunities, 2018’ published by TechSci Research attributes the impressive growth rate to the increased number of real estate and infrastructure projects across the country.”

Introduction :

Probably one of the most taken for granted but prominent elements in our living environment is a ‘light fixture’, also known as ‘luminaire’. This is primarily an electrical device used to create artificial light with the use of an electric lamp, integral to urban and significant rural spaces. A 300 crore decorative home lighting market in India is a small constituent of the 5000 crore macro market in this segment. It is growing at 20% annually as against 7% growth of the overall lighting market. Lighting is doing well in both online and regular retail stores for both personal use and for gifting.

With increasing focus on home decoration, the demand for attractive lighting at various price points has increased, leading to the creation of a high potential market. The market is therefore becoming competitive for MSMEs due to the entry of international products from China, Italy, etc. and brands like Philips Lighting India, Bajaj Electrical Ltd, Crompton Greaves Ltd, Wipro Ltd, etc. in the domestic market. Also, the increasing demand for LED and OLED lighting is contributing to the growth of the segment.

Reminisces Mr. C. K. Jaya Krishnan (Partner - Indira Engineering Company), “In the MSME sector, we have been making lighting products for wholesale vendors. On our part, we planned to enter the decorative lighting market by making better looking, cheaper products, out of locally available materials copying already existing products and selling the products directly. However, we were not able to match the cost.”

“At that time,” says Elizabeth John (Founder - Alcubis Design Solutions), “there were very cheap Chinese products dumped in the market and Indira Engineering Company was unable to compete with the same. Moreover, the production cost was high in Kerala due to higher labour, space constraints, cost etc. The lack of many supporting facilities for finishing, plating, aluminium welding, glass working etc only compounded the situation. It was evident, that design intervention in this project would well be the stepping stone for the MSME, to transform in to an innovative and quality lighting fixture manufacturing brand, from a small time manufacturer of metal parts. With the right skill levels of the setup, the project held the potential of providing the local consumer high quality, locally manufactured products, designed to meet his specific needs at the right price.”

Alcubis Design Solutions is a company working with organisations, helping them design and bring to the market meaningful products and services, by identifying gaps in their services and products, deriving comprehensive product strategies.

Indira Engineering Company is a small time manufacturer of electrical fittings, switch boxes, moulds for rubber auto parts and rubber mattings. They function as vendors for larger manufacturers and wholesalers that deal in auto rickshaws, power tillers and machinery used in the civil construction industry.

Design Objectives :

Elaborating, Elizabeth John says, "The project aimed at enabling growth for the MSME unit. Amicably a lack of design inputs kept the vendors for larger manufactures and retailers, essentially copying existing products from actual samples and images."

Adds Mr. C. K. Jaya Krishnan, "We planned to achieve this through design and development of a range of lighting fixtures, varying from basic products to decorative chandeliers, specifically aimed at the domestic Kerala market."

Says Elizabeth John, "It was decided to design seven ranges of lighting fixtures including six to seven designs in a group, and support with basic marketing collaterals like brochures etc. to reach end consumers through retailers under its own brand name. Creating a cost effective version was another objective."

Design Journey :

A market study was conducted in phase one, where local stores of lighting fixtures were examined. This gave a thorough understanding of the competitive landscape. It included scoping on study of the unit's capabilities on access to design intervention, vendor base associations, availability of skill sets in the vicinity, followed by market analysis to identify similar kinds

of products required. A design brief was generated with a clear and specific understanding of design interventions and boundary conditions to be agreed upon by the client and consultancy. The design segment covered research, designing, creating mockups, testing followed by prototype, documentation and developing marketing support that included product shoots, brochure preparation and finally documentation.



Right - different variants from the new range of lighting fixtures

Says Elizabeth John, "Approval of the design output took place in two progressive stages, by a single point contact from Indira Engineering Company. A focus was maintained on redesigning to create good aesthetics and work with availability of locally available material only."

Adds Mr. C. K. Jaya Krishnan, "The aim was for the designers to be able to have an idea of existing product categories in various markets and thereby not be limited by previous experiences, or, what is present in the local market. Care was taken to broadly categorise and present different types of fixtures like pendants, wall, floor and ceiling mounted. Till then we had only manufactured wall mounted lights. An introduction to various luminary categories was also initiated with images for clarity."

Way Forward :

Says Elizabeth John, "There was a focus on redesigning ambient lighting to light up the room evenly with minimal shadows, accent lighting, directional lighting or lighting that highlighted a certain object or architectural feature in the room. Then there was a

range of task lighting for specific activities like reading, writing, cooking etc. also ornamental. All this with an understanding, that lighting not only provides light but also acts as a decorative object or work of art, keeping in mind the consumer and retail opportunities available to Indira Engineering Company in the room."

Says Mr. C. K. Jaya Krishnan, "Low capital was always a primary concern in the project throughout. Having experimented with a few ideas, we settled on using decorative plates from a single blade. When used repeatedly on sheet metal cut to size, the blade efficiently generates decorative fins without any material loss. These can then be arranged in clusters to form decorative lamp shades. The concept found immediate resonance with us, as the initial investment into blade making, as against mold making was low. The product emerged completely suited for the market."

Continuing he says, "Multiple fin shapes based on the same concept was designed to allow variety and choice and also to take the product range further, at a later stage, to allow multiple lamps to be arranged to create large chandeliers."

The Advantages :

When compared to the older version of the lighting fixture, the MSME unit has benefited in terms of volume, having produced 200 pieces of the redesigned version. The marketing plan includes sales through established lighting fixture retailers in the area, besides e-sales through existing sites like e-bay

"From a marketing perspective," Elizabeth John adds, "the range delivered high volumes through easy to manufacture economical products, that captured the imagination of the target segment. It enabled Indira Engineering Company to reach from the smallest to the largest retailer. From the design perspective, it was the right time to introduce glass as a material to Indira Engineering Company."

Automatic Thrust Turning Plant

Enhancing productivity and quality



The MSME

Kahlon International
Ludhiana, Punjab
Website : www.litlite.com
Contact Person: Mr. Gurpreet Singh Kahlon



The Design Consultant

Harjit Turners
Ludhiana, Punjab
Website : www.harjitturners.com
Contact Person : Mr, Tarsem Singh



Left - automatic machine used for manufacturing thrust washers with higher productivity

“There is a huge demand for new techniques and technologies that will help achieve optimum results in production processes. Manufacturers are incorporating various techniques and process improvement methodologies that focus on process excellence, quality, operational efficiency and customer satisfaction. Again, design plays a very important role here.”

Introduction :

Thrust washers are an important segment of wheel assembly and commonly used in automotive functions. Over time, thrust washers replaced flat washers due to their functional advantage and are high in demand in the automotive sector. Automatic thrust plants produce thrust washers, using the forging operation. Kahlon International has been producing thrust washers for various automotive companies for a long time and are today one of the leading suppliers in the region.

Kahlon International had been facing issues in the manufacturing process of thrust washers and found the process of manufacturing time consuming and slow, requiring too much human intervention. The productivity of machine, quality of outcome and effort of operators were the leading issues in the existing machines, which lacked automation and precision of final outcome.

Says Gurpreet Singh Kahlon (Partner – Kahlon International), “We felt that the redesigning of our automatic thrust turning plant for enhancing

production over the existing model that required reduced man power, was necessary.”

Says Tarsem Singh (Founder - Harjit Turners), “Thrust washers in India are being made either on manual machines, with very low production capacity and total dependence on labour, which is very difficult to find these days. Some manufacturers started making thrust washers on the CNC machine with a very high production cost at (Rs.150/- per piece), apart from high investment cost. Making a thrust washer on an automatic thrust with pneumatic control and PLC costs 10 to 15 paise per piece.

With this, export and local orders will be completed on time and more orders may be booked. The same machine can further produce orders for supplying to other manufacturers of thrust washers.”

Ludhiana based Kahlon International, owned by Mrs. Pritam Kaur a technocrat with about 20 years experience is a manufacturer of bolts, nuts, washers, auto parts and earth mover parts, exporting products

to several countries world wide. The turnover of the company was approximately Rs.5.41 crores in the year 2009-2010.

Harjit Turners, manufacturer and exporter of auto parts and earth moving parts, is a company engaged in designing and manufacturing special purpose machines as per requirements of component manufacturers. The owner of the firm Tarsem Singh, has about 25 years experience in making hydraulic, pneumatic and PLC machines.

Says Tarsem Singh, "The project is very relevant, as this will solve the problem of paucity of labour and also reduce the cost of manufacturing. In the market, the rates of raw material and labour were increasing day by day and therefore the finished product rates too faced stiff competition."

Says Gurpreet Singh Kahlon, "We attended one Design Clinic Scheme workshop in Ludhiana, which had great impact on us and motivated us immensely."

Design Objectives :

Says Tarsem Singh, "As per the client brief, we were looking at an automatic thrust turning plant capable of offering 15 times more production than the existing conventional machine, and also one that could reduce dependence on labour. The objective of redesigning a special purpose machine, supported by pneumatic controls and PLC made the machine more productive with the thrust washer, lowering the cost, as compared to a manual or CNC machine."

"Further," adds Gurpreet Singh Kahlon, "We wanted unskilled labour to work on the new redesigned machine and ensure that the quality of the products maintained uniformity."

Design Journey :

Elaborating Tarsem Singh says, "The process of redesign included simulation, prototype-development, trial run and finalisation of design and manufacturing details, based on its mass production requirements. During the assigned thirty days for steel fabrication work, 3 persons worked on steel fabrication and infrastructure related work, with casting and machining of heads, including boring and grinding, and work on spindle and shafts, completing the work before time in 25 days. Simultaneously, in the second stage the hydraulic and pneumatic systems were fitted after completion of stage one, within 25 days. Motors purchased from the market and electrical panels made in-house, were fitted within 30 days. In stage three, steel fabricated covers made an assembly of all sub-components and the painting was completed, after which a final trial run was conducted. Loading of product in hopper and conveyer did pose a bit of a challenge in the process."

Enumerates Gurpreet Singh Kahlon, "The new design addresses the issue of loading raw material in the forging process. The loading time has been reduced drastically, which made the process very easy for the operator. The machine is operated by hydraulic power and requires no human power for operation. This has translated the whole process into an automatic, error free one. The new design has improved the human ability to work on the machine and in turn save a lot of time and energy for production of thrust washers, besides also helping improve productivity of the MSME unit in the same setup."

Way Forward :

Gurpreet Singh Kahlon is enthusiastic about the re-design outcome and has been using two more machines for their internal production purpose. They are planning to start the production of new designs for other manufacturers as well and hoping to produce two to three machines per month.

Below - thrust turning machines being manufactured in MSME premise



The Advantages :

Enumerates Tarsem Singh, "The redesigned automatic thrust turning plant with pneumatic control and PLC, now provides consistent product quality. Productivity has improved from 28 pieces per hour on manual machines to 450 pieces per hour on the redesigned machine. The cost per piece has reduced from Rs.1.50 per piece, to 15 paise per piece. Moreover, the improved design has enhanced production order possibilities."

Says Gurpreet Singh Kahlon, "The other significant advantage that accrued included automations, reduction in man power, enhancement of quality and increase in production."

Elaborating further, he continues, "Kahlon International had a projection of approximately 10 machines and they expect to produce over 10. The new design helped them in improving the sale, turnover, market share by 30% and augmented profits in the last financial year by 5%. Commonly known companies and brands have started using the redesigned product and its possibility of use by other companies in the near future."

Sums up Tarsem Singh, "The cost of the redesigned product decreased by 20%, the saving on production time and labour was 6 to 7 times. Besides, efficiency enhanced 8 times."

Educational Aids for Children

Learning through playing



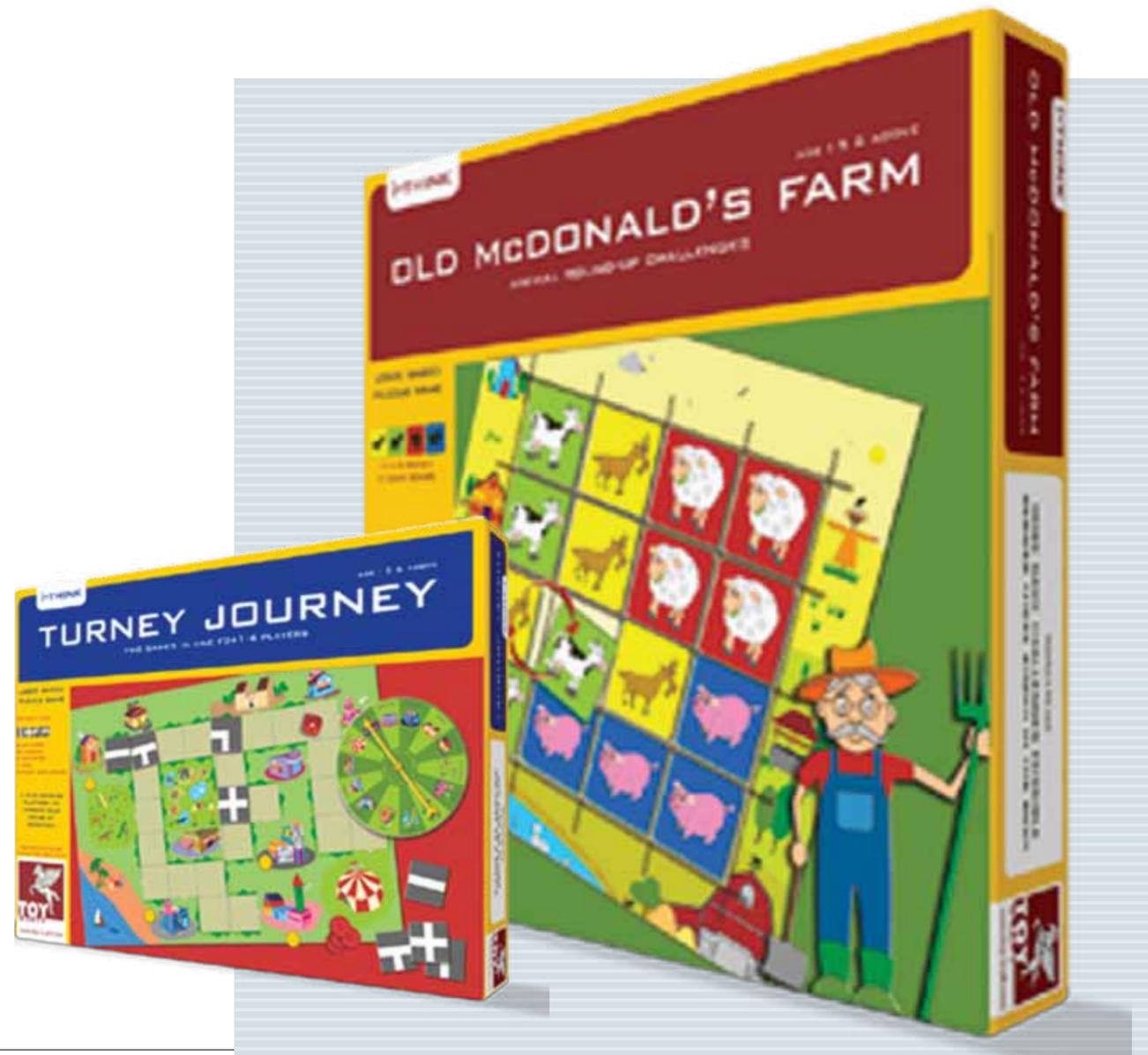
The MSME

Pegasus International
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The Design Student

Ketki Paritosh Deshpande
Toy and Game Design
National Institute of Design,
Ahmedabad



Left - Turney Journey and Mc Donald's Farm

It was a pleasant surprise to experience the acute sharpness of the uncluttered mind of young children, their clear ruthless criticism and open appreciation. The project aimed at conceptualising and developing platforms to sharpen logic and reasoning abilities of the children in the age-group five and above.

Introduction :

The role of creatively designed games, that enjoy an intrinsic element of simplicity, support the child's psychological development at a very grass root level. Today's educational aids are being increasingly used to effectively enhance the overall thinking capacity of the child, which also involves building strategies, that help in speeding the thought process in a fun and interesting way, wherein children learn and grasp concepts in an enjoyable manner, in familiar surroundings.

Increasingly, these games focus on observation, interpretation, comparison, creativity, visualisation, strategy, inference using familiar platforms such as 2D/3D objects, shapes, colours, sequence, pictures, story telling etc. It will provide learning aids using a familiar portfolio, which a child sees in the day to day

life. These games focus on providing a diverse platform for children to play and learn and make them think beyond the normal level of operation.

Pegasus International, a micro scale industry is a fast growing toy manufacturer which markets its diverse range of toys, under the popular TOY-KRAFT brand. "Educational Value" is the core strength of the product line and fittingly, the company has expanded rapidly in categories which provide children with this important function.

Ketki Deshpande and a fellow NIDian, after free lance assignments, recently set up Loafer Designs. They approached the MSME unit to take up the designing of creating two games namely, 'Turney Journey' and 'Crazy Cattle'.

Design Objective :

Creation of educational aids for the age-group five and above through basic puzzles, board games, storytelling, painting, etc. were the perceived outcomes, to ensure accessibility, the maximum retail price of the game was positioned at not exceeding Rs.500/-.

Design Journey :

Says Ketki Paritosh Deshpande, "A preliminary market study showed that the products available were generally either only for fun, or only for learning. Our objective was to understand and determine the market positioning of Pegasus International products in the overall toy market, to gauge the range of existing products available as educational aids and also to understand the strong points and weaknesses of competitor products, when compared with the Pegasus International range. For this purpose, 25 chain shops as well as standalone retailers in Mumbai and Thane were visited. Both have a distinct customer profile, their preferences are reflected in our research finalising."

Elaborates Dr. Shyam Makhija (Director - Pegasus International), "The questionnaire for teachers was targeted at understanding the standard educational aids used in schools and degree of response to each by the students. The questionnaire for parents was targeted at understanding the educational aids generally preferred and recommended by parents, also their budget for educational aids. It was also significant to gauge a child's response to various educational aids, already existing in the market."

Adds Ketki Paritosh Deshpande, "The children were assisted by the mother and older children for understanding a few exercises with complex groups. Later, the children were able to do the same with no or little help from the mother."

Continues Dr. Shyam Makhija, " 'Turney Journey' is a game which helps a child to reason and reach their destination or multiple destinations, using the appropriate tiles. This game helps the child to think alternative and effective ways to reach the destination. The game also induces in the child, a sense of direction, where the game can be played individually or in a group."

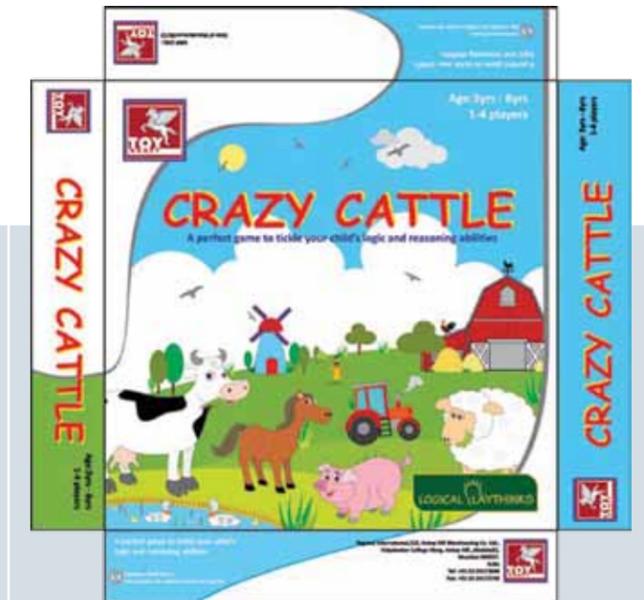
He adds, "The material contents of the game included a game board, spinner, path tiles, dice and 'Turney Journey' cards, where the objective of the game was to collect a maximum number of 'Turney Journey' cards by reaching the largest number of destinations indicated on the spinner."

Says Ketki Paritosh Deshpande, "To determine the children's choice and preference in terms of colour, graphics and difficulty level, the study was conducted across 10 children and their parents".

Continues Dr. Shyam Makhija, "We wanted to redesign and create games that induce children to think beyond the normal realm. Towards this, it was aimed that the graphics be colourful and interesting, to sustain the child's interest for a longer period of time. Also, that the characters and illustrations used be child friendly to enable them to relate to it more efficiently. Besides maintaining flexibility and enabling the child to play in a group as well as individually."

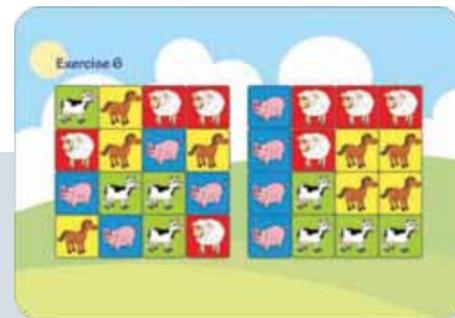
Elaborates Ketki Paritosh Deshpande, "The materials used were to be in compliance with domestic and international safety and quality standards, to ensure a sustained level of interest. The puzzles answers were provided in the game to enable the child to compare and rectify errors. The mood board was deliberately cheerful, vibrant, lively, colourful, energetic, happy and rhythmic. The technical drawings included path tiles, game board, cards and spinner."

Right - 'Crazy Cattle' board and box
'Turney Journey' box



The conclusions arrived at were that the first few exercises were solved by the children comfortably, within 10 - 15 steps, as the groups were in a linear and square format. The same exercise was tackled after two rounds of product development, in approximately 7 steps. As the difficulty level increased, the child required more steps and time."

Concludes Dr. Shyam Makhija, "Based on the feedback from parents, some changes were made in the information booklet. Colour options for both sides were also taken for user-study and the child and his parents were asked to select the look which appealed the most and were incorporated."



Way Forward :

"The board and material used is card board and paper and includes game box comprising game boards, direction tiles, spinners, cards, dice and an instruction manual. In the age-group we had selected, this would offer great future benefits."

Adds Ketki Paritosh Deshpande, "In the age-group selected the game will offer great future benefits. I took this project as a challenge to convert a universally drab idea of logic and reasoning into something that would appeal to the selected age group."

At present the projects that feature in the Pegasus International catalog can also be seen on their website: www.toy-kraft.com 'Turney Journey' and 'Crazy Cattle' renamed 'Old McDonald's Farm'. Both the products are doing very well in the market and have been accepted by the Indian and international audience. The MSME unit participated in Toy-Fairs in Nuremberg, New York and Hong-Kong and displayed the new products. In the Nuremberg Toy-fair Spielwarrenmesse 2013 a Polish company approached Pegasus International for purchasing the manufacturing license of 'Old McDonalds Farm'.



Advantages :

Observes Dr. Shyam Makhija, "Colour coding was suggested by the parents to help child figure out formations comfortably. This helped the child to understand the concept of formations and groups in an effective way. While playing in the group, the children suggested trying out different moves, to solve it with minimum effort. All colour options were also taken for user study and the child and parents were asked to select the look which appealed to them most."

Adds Ketki Paritosh Deshpande, "Familiar locations on one side of the game helped the children connect with the places, while the space element on the other hand stirred the creativity of the child, the children on their own were stimulated to start inventing names for the planets and assigning them. The board with space scenario and diagonal arrangement proved more challenging for children than the board with the linear arrangement. A sense of competition was rife when the game was played in a group, but at the same time, children helped each other to arrive at their 'destinations'."

Highlighting the specific advantages Dr. Shyam Makhija says, "The game improves the child's problem solving and reasoning skills, besides helping them to see the whole-part relationships, increase their visual spatial awareness and develop the child's visual understanding and sense of direction. The game develops the child's analytical abilities in reaching the destination with the directions and tiles provided and the children use their intelligence to understand the routes provided, to reach the identified destination. Children are encouraged to process and experiment, searching for patterns and sequences in everything they do and see."

Adds Ketki Paritosh Deshpande, "As a child places each piece in the puzzle, they are manipulated to see if they fit. The hand eye coordination is enhanced through this trial and error process. The increasing difficulty level of the game challenges the child to think out of the box. The game can be played alone or in a group, as children have to ask for a piece to be passed to them, or discuss where a piece should go when they share the task and learn to cooperate."

Concludes Dr. Shyam Makhija, "There is also a sense of achievement when the puzzle is completed and development of determination and perseverance are natural outcomes. Moreover, the game can be enjoyed by the children in a solo as well as group play."

Left and right - various combinations and deliberations that assisted arrival of the final design



Lighting System

A power saving, environment friendly, multiuse, flexi size *avatar*



The MSME
Goldwyn Ltd.,
Noida, Uttar Pradesh
Website : www.goldwynled.com
Contact Person : Ajay Goel



The Design House
Desmania
Delhi and Mumbai
Website : www.desmania.com
Contact Person : Anuj Prasad



Left - conventional street light
Right above- new design of LED street light

“According to a USA study, if all street lights were replaced by LED lighting system, half the power stations will become redundant and one fifth the power will be consumed, eg it will be 10 watts of LED to 100 watts of the current neon sodium vapour bulbs.”



Introduction :

With the increasing invasion of the landscape by offices, restaurants, factories and similar, the need to switch to LED, to not just save on our power bills, but also safeguard the environment is eminent. The product also offers durability, besides a cleaner and greener option, with the absence of hazardous chemicals.

The primary appeal of LED street lighting is energy efficiency, compared to incandescent bulbs of the same luminance. Research continues to improve the efficiency of newer models. A LED street light based on a 901 milliwatt output can normally produce the same amount of or higher, luminosity as a traditional light, with only half the power consumption.

LED offers a plethora of possibilities by virtue of its flexibility. Its use is multidimensional and can be widely used in indicators and signs, hotels, hospitals, surveillance cameras, medical equipment, television, glow sticks, toys, recreational sporting goods, photonic textile, in phototherapy for acne, sterilisation of water, besides other significant uses – for instance LED light

activation allows drugs to destroy cancer cells, leaving surrounding tissue virtually untouched, and more.

Says Anuj Prasad (Founder Director and CEO - Desmania Design), “Excitement over the too good to be true opportunity was overwhelming at the launch of the Design Clinic Scheme on February 17th, 2010 at the India Habitat Centre in Delhi. I lost no time in informing MSMEs approaching us about the possibilities, where the government was extending a funding support, for equipping MSMEs with a Design Advantage! In the initial enthusiasm, we received an approval under DCS for Goldwyn Ltd's, ‘LED Lighting System’.”

Adds Ajay Goel (CEO – Goldwyn Ltd.), “Our original LED lighting system's design was bulky, heavy and expensive. It was also not aesthetically pleasing, reasons enough for us to seek a redesign. Besides, we wanted more optical improvement, though for this specific feature, we had to additionally seek an overseas design intervention.”

Goldwyn Ltd., an Indian SME located in Noida's Special Economic Zone, has been successfully exporting to Europe for the last 25 years. Designed in-house, developed and manufactured LED lights of all kinds are exported. More than 5% of the revenues are directed towards R&D. Goldwyn Ltd. has a complete lab set up for EMC, EMI, immunity, safety and environmental testing. Their successful export record establishes their credibility, as sensitive to understanding a sophisticated market, supported by state-of-the-art technology.

Established in 1993 as a multi disciplinary design firm, Desmania, a leading design company based out of Delhi and Mumbai is a full body design provider, with multiple disciplines. Enjoying over 15 years in the Industry, Desmania has pioneered design, offering several strategic design solutions based programmes to the industry, that profitably link up innovation and business.

Design Objectives :

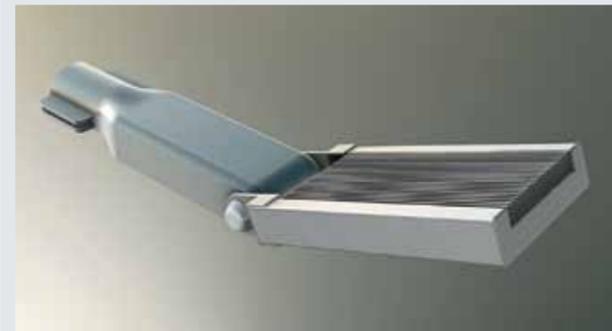
Says Anuj Prasad, "Our brief was to redesign the street lighting system for Goldwyn Ltd., so as to facilitate ease in creating variants, while meeting the target manufacturing cost. The design was to be distinct, while yet competent with conventional lighting system. The idea was to allow the design to further enable the client to create a series of products through moderate, periodic investments. As a design strategy, it was proposed to create a well populated catalogue over a period of 2-3 years that could woo potential buyers, influencers and decision makers, while ensuring that the new design and its variants fitted within the existing lighting unit, without significant modifications."

Design Journey :

Says Anuj Prasad, "Our advantage was that during the early discussions we became familiar with Goldwyn Ltd. and their capabilities, so the dynamics of interaction were smoother and we received inputs at the right time. This was significant, because it is important that

the pace be swift and design activity takes place when there is still 'life' and 'passion' in the project - 4 to 6 months is on this basis a standard Design Cycle, when the excitement and enthusiasm quotient remains high."

Right - LED street light as installed
Below - rendered images of LED street light during the design activity.



Enumerating further he says, "The main areas of design intervention were related to shape, material and features that are easily addressed and on the other, technical constraints e.g. cooling, for which fin like heat sinks create a larger surface area for heat dispelling. Also, in outdoor use there is the problem of water proofing, so the function has to become an integral part of the aesthetics. Earlier, there was only a specific size of the central pole, so water went through and they had a IP 55 – 56 reading, which we raised to 65."

He continues, "There was a team of three headed by Shruti from Desmania Design, who led interactions with the Goldwyn Ltd. team members, particularly with Mr. Ajay Goel and Mr. Keshav Thirani (MD – Goldwyn Ltd.) at key milestone moments, namely at the time of a) Debriefing b) Concept Presentation c) Initiatives d)

Mock up Presentation and e) Technical Engineering. We literally played with the LEGO concept in the redesigning of the LED Lighting System and worked towards scaling up the size as per marketability. Thus critical flexibility is easily achieved with the manufacture of different sizes of LED panels, creating modularity, where one can make rectangular oval and oblong panels, to fit together increase / decrease size and juxtapose, to achieve the desired mass. For adding a solar feature, a tiny panel can also be transfixed on the edge."

Way Forward :

Says Ajay Goel, "The Design Clinic Scheme experience has been good. We further plan to enhance the association through future participation in more such projects."

The Advantages :

Enumerating the positive outcomes of the design intervention Ajay Goel says, "Post design intervention, sales volume increased by 18%, productivity by 50%, market share by 2% (8% compared to 6%) and reliability by 25%. Further, the cost was reduced by 25%, weight by 33% and production time by 40%."

Ajay Goel goes on to add, "The earlier LED street lights gave average lux levels of 12-15 and uniformity ratio of 0.3. Under the same condition, our new design gives an average lux level of 18-20 and uniformity of 0.45. This means that the redesigned lights are meeting the Indian and international lighting standards for city street lighting."

Adds Anuj Prasad, "I definitely see an enhanced export potential after the re-designing, especially to Europe, Germany and UK where competition on price will be another USP in favour of this reinvented Goldwyn Ltd. LED lighting system design."

ENT Multiscope

A state-of-the-art tool adding speed and accuracy to diagnosis

The MSME

Zandig TQM Solutions Pvt. Ltd.
Bengaluru, Karnataka
Contact Person : Mr. Parmeshawaran



The Design House

Icarus Design Pvt. Ltd.
Bengaluru, Karnataka
Website : www.icarus.co.in
Contact Person : Sapna Behar

Brainchild of : Late Sunil Sudhakaran
(Director - Icarus Design Pvt. Ltd.)



Left - first prototype from early concepts
Right above - hand held ENT Scope, the final design.

The Indian healthcare market is becoming increasingly sophisticated, and new technologies are arriving faster than ever have before. One reason for this is that in recent years, we have seen advanced technologies more readily adopted, as awareness increases among physicians and patients.



Introduction :

Usually, ENT doctors and general practitioners, have access to basic, rudimentary tools like mirrors, torches and tongue depressors for examination of patients. In urban areas, they may even have evolved endoscopic diagnostic tools that are few in number and expensive, both as initial investments as well as on cost per usage.

The problem is more aggravated in rural healthcare centers, where on a typical ENT check-up day, one doctor may have to attend to hundreds of patients. With the current infrastructure, the doctor is unable to make timely and accurate diagnosis. Besides, he is unable to refer to previous examinations and offer continuity of treatment. In the medical area, the significance of ENT functioning and its bearing on the health of the rest of the body cannot be underestimated.

The existing ENT scope market was flooded with bulky devices incorporating scope probe, central unit and

large LCD screen, mostly installed at fixed locations like hospitals, clinics or mobile vans. These machines could not be carried to remote locations, they required power source and were not easy to operate.

Late Sunil Sudhakaran (Director - Icarus Design Pvt. Ltd.) once said, "The redesigned ENTview, that we have in mind is an examination tool that enables better visual access to the problem areas of the ear, nose and throat for early and accurate diagnosis. It allows recording and retrieving of data for future reference, is portable and lower cost, thereby holding the potential for increasing accessibility and affordability exponentially."

Icarus Design Pvt. Ltd. is a design firm based in Bengaluru offering services in Industrial Design and Branding, with about 17 years experience in working with Indian and international companies. It has a team of 35 with diverse design and allied expertise.

Design Objectives :

Icarus Design Pvt. Ltd. elected to move with an ergonomically comfortable version of an ENT multiscope, in which the LED light could be integrated to the body and merged with the light pipe of the scope, for a quick release. They considered the nuances and focused on human needs by including a wider range of human aspirations - rational, emotional and cultural, to augment and enrich the pool of inputs and ensure the outcome of meaningful solutions. Moreover, their objective was to produce the multiscope at a reasonable price, to be used by trained technicians in rural settings for primary ENT screening and telemedicine, where the technician was able to do the preliminary screening in a remote village, for example and then take simple remedial action if necessary. In the situation of a complex problem, the data was targeted to be easily transferable to an ENT specialist by email and advice rendered over the phone, from any point in the hospital.

Design Journey :

In their preparation for the designing process, they focused on elements such as the target group, performance criteria, essential and desirable features, also time, money, resources and constraints including working assumptions.

The design team visited people at the grass root level - looking for insights, interpretations and design finalisation. They then configured the multiscope to become more user friendly, after which, they refined it aesthetically and moved into prototyping. Icarus Design Pvt. Ltd took the prototypes to the field and refined the electronics, integrating it as they worked with an electronics development partner.

In the redesigned version of the multiscope, the ENT recorder device enclosed the Kodak CD 14 camera, where they intended to combine the two AA batteries of the camera and the Li-ion battery (of LED) into one Li-ion battery, which stimulates with the use of a charger, connected to the device through a simple jack. The operational controls (like image capture, video start/stop and zoom in/out) were planned to be at the finger tips (on or near the scope housing). PCB's were placed in a manner where they were connected to the camera's USB port, which was also required on the device to transfer files to a computer. The light source (1.25-3W super bright LED) was required to be mounted on a small PCB and placed below the scope's light pipe. The

LED intensity controller circuit and control were worked upon and the possibility of the LCD screen rotating 90 degrees was explored.

Icarus Design Pvt. Ltd. looked into the issues of visibility of probe end during scope entry and screen during examination, single handed use, position of controls, catering to frequent operations, long and repetitive use, ambidexterity, grip, maneuverability, presence of obtrusive projections, ease of flexibility options (eg. non standard lights on probes), safety against falls with the use of crash guards, balancing crashes, bulk distribution, comfort in holding all three positions, intuitive controls, easily fixable and removable scopes and feeling of robustness.

The other aspects, that were taken cognisance of, while working on the design details were related to aesthetics, functionality, manifesting assembling, servicing and mechanical integrations.

Way Forward :

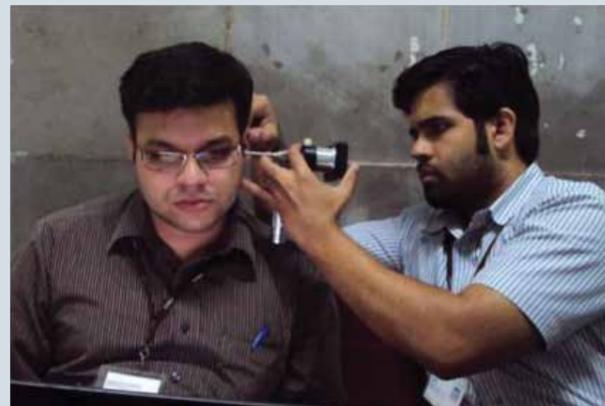
On the future plans, Icarus Design Pvt. Ltd. plans to develop an integrated software system so that all patient data, audio video-text information goes into a database that can be easily searched, retrieved and transmitted. This device is primarily going to be a screening device used by trained technicians in remote villages, where there may or may not be doctors, or only visiting doctors present.

ENTrerview was awarded a gold medal at the 'Innovators Competition' at the DST-Lockheed Martin India Innovation Growth program – 2012. It was adjudged amongst the top 30 technology innovations in the country from a total of over 800 evaluated technologies.



Above - finished prototype for testing

Right - first concept being tested final prototype



The Advantages :

Zandig TQM Solutions Pvt. Ltd. viewed the redesigned ENTrerview as an effective integration of a mechanical adaptor, light source, hardware and software into a compact, battery operated handheld device that is highly ergonomic to use. The mechanical adaptor allows easy interchangeability of ear, nose or throat scopes. These scopes are FDA approved bought outs. The light source is built in and optimised for the three scopes. Video recordings of the examination can be stored in the device and transferred to a computer. The interface is very simple and easy to use, requiring almost no training for doctors to begin using this product. Health care workers can use it with few instructions.

Multiscopes used in big hospitals are expensive. The price typically ranges between Rs 7 lakhs and Rs 30 lakhs. These high-resolution systems are designed for surgeries and only hospitals can afford them. The ENT multiscope is targeted at independent physicians and ENT specialists with small private practices, specifically designed for health workers in rural settings, where the image that is created is not of a good quality. The new multiscope has a digital camera with a light attached to it, which makes it easier to see and the quality of the image is also better. In the new redesigned version, the light source is integrated to the product and it looks like a safe, confidence inspiring medical product.

Water Purifying System for rural India

An effective solution



The MSME

Mahavir Pumps Mfg Pvt. Ltd.
Kolkata, West Bengal
Website : www.mahavirpumps.co.in
Contact Person : Praveen Poddar



The Design Consultant

Pulaha Dasgupta
Kolkata, West Bengal



Left - new design safe water hand pump with advanced filtration system

“Most of the large commercial water filter companies have not focused on developing an all inclusive rural water purifier. The available systems provide only a partial solution and fail to address the comprehensive problem, calling for high reliability.”

Introduction :

Ready access to pure drinking water is a basic necessity and its easy and adequate availability, a challenge across the country, more so in the more remote parts. Water borne diseases are one of the major factors affecting the health and life of rural and urban India, making the issue that much more critical. The hallmark of a good water system is its being cost effective, easy to install, also maintenance and electricity free. Safe, pure drinking water systems are the pressing need of the hour, where rural India faces issues related to paucity of investment, consistent power supply, maintenance and access to villages, in the context of regional impurities and user behavior. The significance of such a water purifying system cannot be overestimated in its use and function.

Recalls Praveen Poddar (Director - Mahavir Pumps Mfg Pvt. Ltd.), “Initially, there was no comparative product in the market other than RO purifiers, that had similar features. It was proposed to incorporate a unique add-on or attachment capable of transforming a standard ‘India Mark-II deep well hand-pump’, into a point-of-use source of pure drinking water, that could remove colour, odour, hydrocarbons, bacteria, virus, arsenic, fluoride and iron from the source water, without the use of electrical energy.”

Adds Pulaha Dasgupta (Industrial Design Consultant), “There has been a requirement of a safe water system in rural india that is cost effective, easy to install and operate. The product it was believed, required periodic maintenance which could be done on site, through maintenance contracts, with the installing agency.”

Says Praveen Poddar, "The existing short fall in the original version of the product, propelled the decision for considering design intervention. The large player did not serve this market segment, which requires a unique direct channel system. The sector is dotted with few players with limited capabilities, where the market competition is low and market presents several challenges in terms of product usability and delivery."

Mahavir Pumps Mfg Pvt. Ltd. (MPML) has been engaged in the business of rural water supply work for

more than two decades, mostly in eastern and north eastern India. They have specifically been involved in the manufacturing and supply of ISI marked deep-well hand-pumps, which today are synonymous with sustainable sources of drinking water in rural India.

Pulaha Dasgupta is an Industrial Designer, with 30 years professional expertise in industrial, educational and craft sectors, having worked with a wide range of materials and processes in the automotive, electronics, appliances and furniture segments.

proof, user friendly and easy to operate, functional without storage tanks and electricity, and be able to provide both raw and pure water and one where purified water output should not be less than 75% of raw water output of the hand pump."

Says Praveen Poddar, "The original premise for designing the water purifier was based on the requirements of the 'Jalmani Project' of the central government. The primary shortfalls were mainly related to two aspects, namely processes and practices. Since the nature and intensity of water contamination varied widely in different regions of the country, several processes or means of purification were adopted to address the local issues. Most of these solutions involved slow multi-stage filtration procedures requiring storage tanks, pumps, complex plumbing and electrical energy to operate."

Concludes Pulaha Dasgupta, "The primary challenges faced during the design process were related mainly to the location identification of cost effective vendors for the various subcomponents, required for product and prototype fabrication."

Way Forward :

Recalls Pulaha Dasgupta, "The MSME staff members, especially the nodal person, were design sensitive, particularly with regard to the functional, transportation installation and user friendliness aspects of the new redesigned water purifying system."

Sums up Praveen Poddar, "When compared to the older version of the product 'Modular Drinking Water Purifier Attachment for Hand Pump – Non Electrical' the pump today, has the potential to increase the sales volume of the MPML manifold. We have an immediate target to increase topline to INR 10 million for FY 2013-14 and to INR 100 million over the next 5 years. Our experience has been very enriching. In fact the Design Clinic Scheme has acted as a catalyst in redesigning the water purifying system product. Having experienced the power of a well designed, ergonomically correct product, in future it will be inevitable that we give the design aspect priority."

Design Objectives :

The primary product of the MSME unit was the India Mark-II deep well hand pump, used extensively throughout India and neighbouring countries, especially in rural areas. The unit was also adept at providing drinking water solutions in association with various government agencies engaged in rural water supply programmes. This part of the country is also plagued by ground water contaminations from arsenic, fluorides and iron, in addition to common biological contaminants. Says Praveen Poddar, "Learning from more than two decades of experience, the unit realised that there is a great need and commercial potential for developing a rural water purifier, capable of providing comprehensive relief from diverse water contaminants in the region."

Design Journey :

Pulaha Dasgupta says, "Based on this premise, it was decided that the redesigned water purifying system should be an add-on for the 'Mark-II hand pump', requiring minimum reconfiguration of hand-pump components to be suitable as a retrofit component, modular in terms of system design to accommodate the presence, or absence of contaminants in source water." He further adds, "The entire product had to be designed with the objective of creating a seamless

and easy integration with the hand pump, while ensuring that the primary functional requirements of water purification were not compromised. It was to be ensured that the users were not alienated from their familiarity with the hand pump, with a simple and fast learning curve for operating."

Elaborates Praveen Poddar, "We also believed that the new designed product, should be cost effective for government programmes, functional and reliable for at least one year without major maintenance, be tamper

The Advantages :

Says Praveen Poddar, "The main advantage that emerged from the re-designing effort was the emergence of a comprehensive water purifier, capable of handling a wide range of contaminants as and when required, due to a modular system design easily integrated with the 'Mark-II Hand-pump', extensively used in rural areas. It is a compact light weight module that can be preassembled and easily transported to remote areas and retrofitted to existing hand pumps, within a very short time. Besides, it requires relative low maintenance and is user friendly."

Adds Pulaha Dasgupta, "It is expected that the new redesigned water system will be very cost effective, considering its capability of combating different types of contaminants simultaneously. Besides, the preassembly and commissioning time at site will also be considerably less than in the case of the original version, due to absence of complicated plumbing requirements. Transportation costs will also be lower owing to compactness and low weight of the product."

He continues, "The redesigned product has the capability of completely transforming the cost benefit curves on a long term basis, in favour of reduced budget outlay, on a per capita, per annum basis. In fact consumers find a clear benefit on near term basis and ease of use and maintenance."



Right - various parts of filtration system incorporated in the India Mark-II hand pump



Newspaper Vending Machine

Vending an efficient access to daily news



The Design Student

Renugopal K
M. Sc. (Engg) in Product Design
MSRSAS, Bengaluru



Left - new look of news paper vending machine

“Vending machines are going to see a great demand in various sectors. Growing urbanisation and corporate culture provides opportunity for vending machine installations. Improved technology and new applications have facilitated the market to grow further.”

Introduction:

A newspaper vending machine is integral to brushing one's teeth for most, at least for the greater part of the urban world - a start point for the day's cerebral activities and personal image building, in terms of being an individual aware of where the world is, and what it is at. Access to this powerful tool on a daily basis is critical to effective daily functioning.

Newspaper vending has essentially been a manual job in most scenarios which require substantial man power, with time for serving individual customers, besides space engagement.

K. Renugopal, a student in the final year of product design (MSc) visualised an automatic dispensing system of newspapers, in the urban landscape where space and time are crucial to locations like the metro station, bus stand, busy cross roads, offices etc. The need for dispensing newspapers in an appropriate manner requires technological intervention, with basic understanding of customer needs. He realised the need for integration of these systems for simpler solutions and improved experience for the customers.

Design Objective:

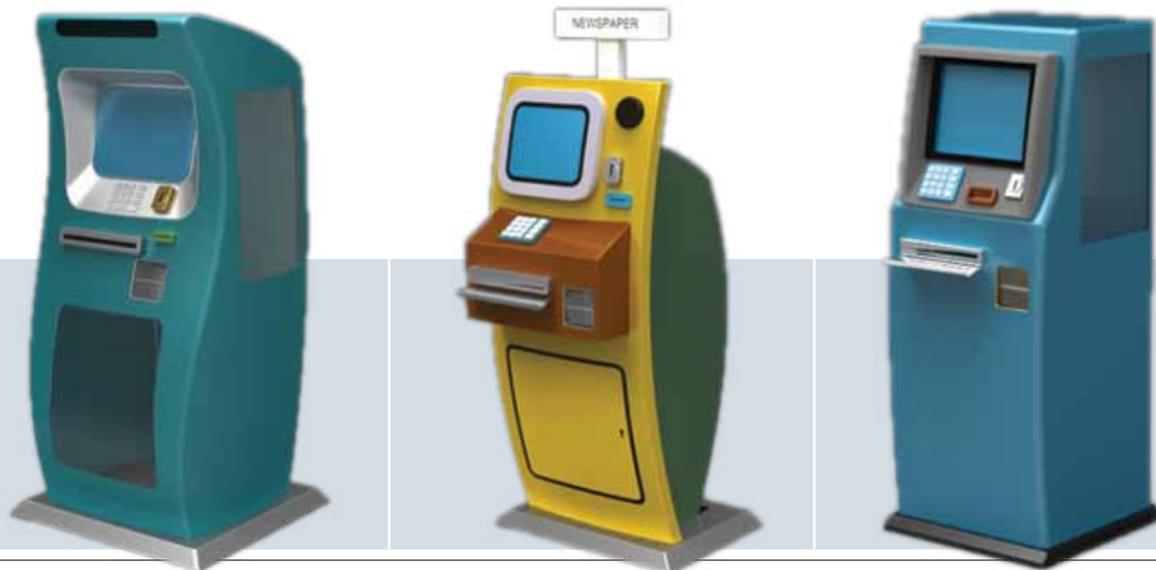
Says K. Renugopal K, "We outlined our project objectives, which were namely to conduct a survey on newspaper vending machines and understand latest trends, present practices and collect relevant data. Also to collect data of existing designs through product study, visual design exploration, user study and market study, besides creating Quality Function Deployment (QFD) on the basis of customer voice and arrive at Product Design Specification (PDS). Also to meet customer requirements and generate concepts as per PDS, create 3D models of the generated concepts and select the final concept, using the weighted ranking method."

"Basis the above," adds Supradip Das (Asst. Professor, DOD – MSRSAS), "Finally to build a mock up model of the final concept and take user feedback."

Design Journey:

Recalls Renuogopal K, "The survey continued and extended to ATMs, parking lots, ticketing counters, coin dispensing machines also, cold drinks, candy, pizza, coffee and snack vending machines. Thereafter emerged our first concept, with distinct advantages of newspaper dispensers including better service to the customer, ability to handle more traffic, capacity to serve a range of firms competing within the same industry, a sense of pride by the user and economy on space occupied, compared to a stall and flexibility

of placement almost anywhere. The second concept was designed as per Indian anthropometric ergonomic dimensions through the newspaper vending machine. Three types of newspapers, fifty each in number, were available and loaded at the bottom. Selection of different newspapers was possible and facilitated with the help of using the touch screen. Invalid coins were rejected from the sensor to the coin box and a speaker was available for guiding the process of selecting the newspaper."



Right - various concepts before finalisation and prototype testing



Above - rendered image with human figure for reference

Elaborating on the others Supradip Das continues, "In the third concept, two types of newspapers were available namely, The Times of India and The Hindu, where the payment mode was via coins and cards. Both sides of the newspapers were shown as advertisements to the people and the cost of the newspapers were mentioned on the machine itself. The cost of the newspaper varied on week days and weekends and was reflected as such. The touch screen was used for selecting various types of newspapers and card facilities available to those, who did not have access to coins. The fourth concept offered the facility of display to three types of newspapers, where speakers guided the newspaper customer through the selection, by using the help button, in the machine fixed into the ground. In the fifth concept, newspapers were loaded early morning everyday, and both sides of the newspapers were visible as advertisements, designed as per ergonomic dimensions and accessed through inspection. Concept six targeted at newspaper vending machines in public places, was designed to make three different newspapers available. The shape was designed differently with improved safety, aesthetics and ergonomics as per the Indian anthropometric dimensions."

Advantages :

Supradip Das says, "The final mockup model that was set up, helped us find the problems of the newspaper vending machine from the users, with an attempt to try and solve their problems, besides presenting a good design with ergonomics, where safety and aesthetics were given due weightage."

Concludes Renuogopal K, "The product is ready for the purpose of further adaptation by interested industry. The study also provides a ground for the design of new dispensers in the area of products like books, snacks, water, cold drink bottles, milk and many other items for our day to day use, which is going to be an essential part of the service industry in the near future."

Continues Renuogopal K, "Concept selection was a challenging part, where the right concept had to be selected for further improvement and implementation of the design - as key to the success of the project. Based on weight ranking method, all the six concepts were placed and evaluated according to their features. The matrix helped in understanding the importance of features to be carried in the final outcome and made the product more acceptable in the context, it was going to be implemented. Based on the selected concept, the mock up was planned and prepared."

Way Forward:

Summarises Renuogopal K, "For me as a designer, the process was a great experience in that it improved my knowledge of design, data collection, ethnography research and manufacturing. Finally, I also found a solution to the problem of making the screen panel shape which also presented a very good experience for learning, welding, sun board sticking and applying metal paste. All exposures that will certainly support my future professional endeavours."

The project has been completed as per the proposed deliverables and schedule and the product is now ready for further adaptation and implementation through commercial activity for interested MSMEs."

Syringe Infusion Pump

Enhancing precision in critical use infusion pumps



The MSME

Yashtech India Pvt. Ltd.
Nashik, Maharashtra
Website :
www.indiamart.com/yashtechindia
Contact Person : Sanjay V Surushe



The Design House

Moonwalk Design
Nashik, Maharashtra
Website :
www.indiamart.com/moonwalkdesign
Contact Person : Prashant Gatkal



Left - new syringe infusion pump
Right above - old syringe infusion pump

“With a population of more than one billion, India’s greatest healthcare challenge is to ensure that all citizens have access to affordable and quality healthcare. The MSMEs are coming forward in providing world class alternatives in a big way.”



Introduction :

Syringe infusion pump, also known as syringe driver is a small infusion pump used to gradually supply, controlled quantities of fluid to a patient, or for use in chemical and biomedical research. The most popular use of syringe drivers is in palliative care, to continuously administer analgesics (painkillers), antiemetics (medication to suppress nausea and vomiting) and other drugs. Syringe drivers are also useful for delivering IV medications over several minutes. In the case of a medication which should be administered gradually, this device saves staff time and reduces errors.

All these medical equipments are basically used in ICUs for treatment of critical patients and premature babies. They are pumps for delivering extremely precise amounts of the drug into the patient’s body under controlled conditions and manufactured under very strict quality control. They follow the latest engineering practices.

Says Sanjay V Surushe (Managing Director - Yashtech India Pvt. Ltd.), “The earlier syringe infusion pump was a top-loading model that had limitations in stacking multiple pumps, one above the other, so the need for a front-loading syringe pump became evident.”

Adds Prashant Gatkal (Proprietor - Moonwalk Design), “The market for syringe infusion pumps is facing major competition and challenges from Chinese suppliers. They are able to capture a significant section of buyer’s markets, mainly owing to their price. Unfortunately, most Indian buyers give more importance to the price, rather than long term support and performance.”

Also adds Sanjay V Surushe, “The syringe infusion pump had to be injection molded for precision while functioning, also easily manufactured and open to speedier production. Our existing product, even though technically superior, lacked the aesthetics compared to other international brands. These are some of the factors that urged us to consider design intervention.”

Yashtech India Pvt. Ltd. was launched in March 2000. Since its inception, it has been mainly dedicated to the development and manufacturing of electro-medical equipment and industrial engineering equipment. The core strength of Yashtech is R&D and all its products are developed in-house. The USP of Yashtech India Pvt. Ltd. is to provide import substitute alternatives, to high value products.

A multi-disciplinary firm working in the field of architecture, interior design, product design, exhibition design and tensile structures, from strategy to product innovation, Moonwalk Design has connected companies to their consumers by understanding and fulfilling unrealised user needs and creating the emotional connect.

Design Objectives :

Recalls Sanjay V Surushe, "Damage due to spilling of medicines on pumps stacked one below another, was a major problem in many existing pumps, that we realised required addressing. Visibility of the control panels on these, was the second issue. Also, situations like accidental push to the syringe and use of the syringe plunger to hang objects and bags needed tackling in the Indian hospital scenario."

Design Journey :

Says Prashant Gatkal, "In our endeavour to streamline preparation for the design process, we began with the effort of first creating a unique aesthetic look, so as to differentiate it from its competitors. In the product packaging, all the electronic and mechanical components had to be packed independently and accommodated easily. The interface of the control panel was designed as such that can be comfortably used by less qualified staff of the hospital."

Adds Sanjay V Surushe, "The cabinet was designed in a manner to bring its mold cost and size under control. Also a robust chassis was created to support the mechanical components and mounting clamps. We also broke away from the box like cabinets seen in the ICU related machines and took a totally different form, an ellipsoid, to make a unique statement for the new product."

Continuing Prashant Gatkal says, "The rapid prototyping was easy to make, but the under cut in one of the parts posed a major challenge and hence we had to make a collapsible core-cavity design for production."

Way Forward :

Enumerates Sanjay V Surushe, "It was a great experience associating with the Design Clinic Scheme team. We could upgrade our product only because of the financial support of the Design Clinic Scheme. The cost involved in design up gradation never existed in our budget. With this timely support, we are now looking forward to a very bright future. It has been a catalyst for our future growth. We wish the Design Clinic Scheme great success and hope that many more MSMEs will benefit in future. NID Ahmedabad, is a world class centre and we are proud of our association with them through this platform."

Concludes Sanjay V Surushe, "The staff has started identifying themselves and the product with the quality of any multi-national company, that has elevated their morale and given them a sense of satisfaction, on the quality work they are associated with."

Right - assembly during production, product installed and product in use



The Advantages :

Enumerating the advantages Prashant Gatkal says, "The new redesigned syringe infusion pump, is now comparable to international brands in terms of aesthetics. This helped us in gaining initial acceptance of the product during our marketing effort. A unique product identity was created with the new design that is not easy to replicate. Overall, a robust, secure and thoughtful product for the Indian hospital scenario emerged from the redesigning effort. Moreover, its production time has reduced and per piece production cost decreased, with sales figures showing healthy signs of growth."

Adds Sanjay V Surushe, "The per piece manufacturing cost of the redesigned product has reduced by approximately 15%, compared to the cost of the original product. Also, since the time for fabricating and assembling the whole product has reduced significantly, we can now work on development of other customised products as customisation is our USP."

He concludes, "When compared to the older version of the syringe infusion pump, we have immensely benefited having produced 300 pieces of the redesigned version, as compared to the original design of which 200 could be produced. The new design has helped us improve our sale turnover, market share by 20% and augmented profits in the last financial year by 15%."

Hydraulic Rescue Power Tools

A sophisticated, critical use,
range of life salvaging equipment



The MSME

Shrikrishna Agro Equipments Pvt. Ltd.
Pune, Maharashtra
Website : www.rocksplitter.in
Contact Person : Dinesh Ganeshwade



The Design House

Automotif
Pune, Maharashtra
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Safety tools for rescue operations

Rescue operation tools are useful where space is at a premium, as in the case of a fire, vehicle rescue, difficult terrains or remote locations. With increasing demand for safety and preparedness, rescue tools are becoming a necessity in fire brigades, municipalities, railways, building segments, highway patrol, military, police etc. a worldwide target market exists.

Introduction :

In the eventuality of a motor vehicle accident, earthquake or other natural calamity, when conventional means of exit are impossible or unadvisable, efficient rescue tools are critical for safe extrication or removal e.g. the vehicle from around a person in a motor accident. Hydraulic rescue tools are used by emergency rescue personnel to assist vehicle extrication of crash victims from small spaces. These tools include cutters, spreaders, door busters and rams.

The 'cutter' is a hydraulic tool designed to cut through metal, specifically a hydraulically powered shear. A 'spreader' is a hydraulic tool with two arms which come together in a narrow tip, using hydraulic pressure to separate or spread the arms. The tip of the tool can be inserted into a narrow gap between two vehicle panels (such as between two doors), pushing apart the metal in the panels. 'Spreader-Cutters' are a 'combi-tool', which combine the cutting and spreading functions of two separate tools into a single one, which allow a rescuer to quickly open a gap wide enough to pull free a trapped victim.

Says Dinesh Ganeshwade (Owner - Shrikrishna Agro Equipments Pvt. Ltd.), "There was no Indian

manufacturer for hydraulic rescue tools but, there were several international companies manufacturing this category. Some of the leading ones being Holmatro, Genesis Rescue Systems, Lukas, Phoenix Rescue Equipments, Inc and Amkus Rescue Systems. The Design Clinic Scheme supported faster and better development. The cost of these products is very high and technology used critical, so the development of these products entails a high cost, where such high investments are not the norm with MSME. So, support from the government plays a very important role in meaningful development."

Shrikrishna Agro Equipments Pvt. Ltd. was founded in 1996 with an aim to concentrate and manufacture unique, high performance range of specialised equipment.

Says Satish Komaragiri (Head - Transportation Design, Automotif), "We assured Shrikrishna Agro Equipments Pvt. Ltd. that we would develop a new concept, quality product to make India self sufficient."

Automotif based in Pune, specialises in automotive styling and transportation design. The design firm is engaged in offering industrial design, engineering and prototype.

Design Objectives :

Recalls Satish Komaragiri, “We studied benchmark products as the MSME was venturing into this product for the first time. What we identified to be the areas of design intervention basis existing international models were ergonomics, light weight, ease of operation and distinct product branding through design.”

Design Journey :

Details Satish Komaragiri, “We conducted our research survey at Central Fire Brigade Station, Pune, where we interacted with officers and noted the presence of fire tender engines, bronto, rescue vans and four ambulances. The rescue van carries essentials like hydraulic spreader, cutter, ram, chain saw, battery operated chain and scissor, telescopic hydraulic light master and various other intrinsic necessities for rescue operations.”

Continuing, he says, “We also observed, that when the electric or DG power pack can not be used due to a lack of electricity, or where these power packs cannot be taken, manual power packs are used, where two types of couplings are used namely quick change coupling and manual coupling.”

“In phase two, we worked with initial sketches basis a 3D model of a selected concept, built on the same design language, adapted in all the tools. Phases three and four focused on design detailing and manufacturing drawings, before launching into the prototype and testing stage.”

Elaborates Dinesh Ganeshwade, “On the cutter manufactured by Weber Hydraulics, it weighed about 10 – 12 kgs, which was lifted or handled with two hands during operation. The center handle was placed near the centre of the cutter so that when held with the center handle, it remained horizontal. Both handles were knurled for a better grip and the center handle was adjustable (rotatable) so that the handle could be adjusted according to the cutter position.”

Adds Satish Komaragiri, “For the spreader we worked on creating a capacity of 5 tons with a weight of approximately 20 kgs. For the three handle positions, two at the center and another at the end were provided for better handling and control of spreader in vertical and horizontal positions. For ease in transporting, owing to the weight, the spreader was carried in a wooden open box in the rescue van. For the operating knob, push buttons for opening and closing the spreader jaws were used. By attaching the chain to its jaws, with ends tied up with some stable objects like the tree, we kept in mind, that the spreaders be used to pull vehicles or objects.”

Says Dinesh Ganeshwade, “For the combi tools, the Automotif team targeted a weight of approximately 10kg for a battery operated model, that had a shoulder strap to take a maximum load on the shoulder and free the hands to operate the tools. There was also a round knob for opening and closing the jaws of the tools. Similarly, in the rams we gave two pistons to lift the object, where after the first piston spreader, it extended out to the complete length and the second piston start lifting up. A round knob was entitled for opening and closing the pistons of the tools.”

Basis use of the new designed product in terms of how it has enhanced the real living situation, ergonomics played a key differential in the new design. As this is an emergency category equipment, they cannot fail in their operation. The newly designed rescue tools are light weight, ergonomical and easy to use by individuals in most cases.

Way Forward :

When compared to the older version, the redesigned hydraulic rescue tools by Shrikrishna Agro Equipments Pvt. Ltd. benefited them in terms of volume. The MSME unit has projected a production of approximately 100 machines over a period of one year. The new design has helped them improve the market share by 15%, augmenting profits in the last financial year.

Says Kunal Sharma (Design Engineer - Automotif), “The practicality of a design needs to be checked first before investing in development, this approach has created success for the project.”

Right - new design being tested in the field



The Advantages :

Says Satish Komaragiri, “We have got better designed rescue tools at par with international versions and are now confident about competing with the best in the industry in this domain. The new design is definitely appealing to our customers and the cost too has come down, as intended to support the process for a scaled up production.”

Further, Dinesh Ganeshwade says, “We are the first Indian manufacturer for this equipment and there is ease of maintenance and service. Moreover we believe, that new design and development activities are like an investment, which materialise into profits over a period of time.”

Summarises Satish Komaragiri, “We are now confident of competing with the best in the industry in this domain. The new design is definitely appealing to our customers and the weight of the equipment has reduced by 20%, compared to the original design.”

Transfer Fusing Press

For fueling finesse, in the fine art of dressing



The MSME

Vishesh Electro System
Ludhiana, Punjab
Website : www.fusingpress.com
Contact Person : Mr. Mohan Singh



The Design Consultant

Narinder Singh Gora
Ludhiana, Punjab
Contact Person : Narinder Singh Gora



Left - new transfer fusing press with design improvements

“According to the Indian Textile Accessories and Machinery Manufacturers’ Association, import of textile machinery, components, spares and related products in year 2012-13 is nearly 14 per cent more than the previous year. Exports of these items were Rs. 1,462 crore, a drop of 4.17 per cent in the same year.”

Introduction:

In an era where power dressing, corporate dressing, Friday dressing, fashion consciousness, image building are hallmarks of successful contemporary living, the significance of the finer elements of apparel finishing cannot be underestimated. In this regard, a fusing machine enjoys immense importance. A fusing machine essentially applies heat and pressure to two or more superimposed pieces of fabric, backing materials, laminates, etc. to adhere or ‘fuse’ them together, to provide reinforcement to those parts of the garment, that receive rigidity such as fronts, cuffs, collars and pockets.

Traditional fusing machines include both the ‘in-line’ and ‘return-to-operator’ types. The complementary pieces are fed into an inline machine from one side and discharged in its fused form from the other side, ready to be suitably positioned into the garment offering the right kind of elegance.

Says Mohan Singh (Proprietor - Vishesh Electro System), “There were some issues, that we were facing with the existing version of our fusing machine. For one, the moving cables wore out frequently and there was a lower production of finished articles. Besides, the old machine was not user friendly and required a great deal of maintenance. Also, there were too many movable parts, which made the operation rather cumbersome. Competition from China and the local market did little to help our situation.”

M/S Vishesh Electro System is a sole proprietor business venture located in Ludhiana, Punjab. They started operations in 2002, with a relatively modest investment of Rs.15 lakhs only. They are an established and respected manufacturer, exporter and supplier of a comprehensive array of quality assured garment printing machines.

Since March 1972, designer Narinder Singh Gora has been working in the field of tool and dies manufacturing technology. During this period, he

worked with internationally renowned companies and augmented his skills via a 13 months training in Germany from 1985-86.

Design Objectives :

Recalls Mohan Singh, "A marketable product with better aesthetics was the key to our firming specific design objectives for this project. For one, we worked on an automatic locking system that slid while printing."

Continues Narinder Singh Gora (Design Consultant), "We were clear that the machine had to be user friendly, compact in design, less prone to wear and tear of moving parts with better productivity and quality besides standardising all elements of design, for ease of manufacturing."

Further, Mohan Singh elaborates, "We emphasised at the start that a complete redesign of the machine be undertaken, where a robust re-design of the machine led to ease in manufacturing, with minimum wastage through creation and control of all details of the project."

Design Journey :

Continuous improvement in the existing systems, machines and processes is the need of the hour in the present competitive scenario. Mohan Singh had identified a few issues from existing machines and noted various problems faced by their customers. He was in discussion with Narinder Singh Gora regarding

resolving these issues and unanimously found that the Design Clinic Scheme offering held the potential of meeting their objective of improving the machines.

Mr. Mohan Singh says, "The design initiative has helped them rectify the existing problems and also helped in improving the design of the machine for better productivity, in the process of manufacturing. It has

reduced the quantum of rework and repair caused during production and created a bench mark in their internal manufacturing process in general".

Narinder Singh Gora says, "The machine is easy to maintain and has lesser number of issues like hanging wires, loose fittings, breakdowns, etc. during the operation at the garment factory. He adds that it has been able to improve the confidence of its customers due to the more reliable and consistent performance and inturn helped the MSME unit compete better in the market."

Way Forward :

Continues Mohan Singh, "Initially we were selling machines worth approximately Rs.45 lakhs per annum in the north Indian market, including Delhi and NCR region. The standardisation and improvement in machine design we believe, helped us expand our market to Surat, Ahmedabad and Indore, where we expect to boost our sales four fold."

He concludes, "For the transfer fusing machine for garment printing, the target end user is the garment processing industry. There are approximately 1000 units in and around Punjab. Other than Punjab, we have an existing and potential market in Delhi – NCR, Kerala, Kolkata, West Bengal, Tirupur, Surat, Ahmedabad, Panipat etc. With the improved design, we can target the potential user with a better product."

Narinder Singh Gora says, "The initial production of the machine was around 150 numbers per annum and the projected number is expected to increase to 1,000 numbers per annum, over the next five years. The MSME unit has been able to sell the machines to many garment units from Ludhiana, Jalandhar, Delhi, etc."

Mohan Singh says, "We are very pleased with the transparent working style of the Design Clinic Scheme officials, who were very cooperative and helpful by nature and we definitely see ourselves joining hands with Design Clinic Scheme for redesigning and understanding improvement potential in future products."

Right - Transfer fusing press



The Advantages :

Encapsulates Mohan Singh, "The aesthetics of the new product have improved significantly. It has become more user friendly, the moving cables have been eliminated and require minimal maintenance."

Elaborates Narinder Singh Gora, "The cost of the original transfer fusing machine for garment printing was Rs.65,000/-, the new redesigned one costs Rs.60,000/-. The saving on production time, labour, material is 18%, efficiency has been enhanced by 25%. Finally the redesigned version has produced 165 numbers per annum, as compared to the original design, which produced 150 numbers per annum."

Adds Avtar Singh (Electrical Engineer - Vishesh Electro System), "I find the new redesigned transfer fusing machine for garment printing, easier to manufacture as compared to the older version."

Educational Toys

Educational connection through play action



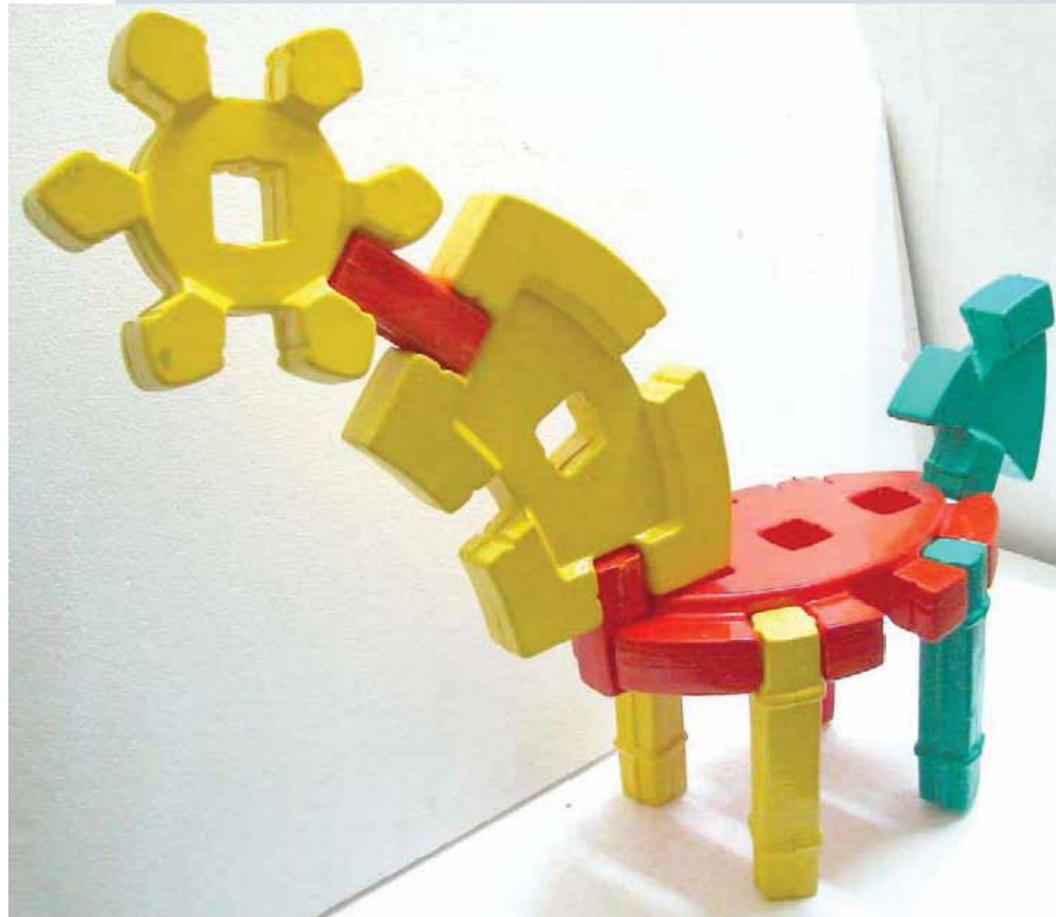
The MSME

Playgro Toys India Pvt. Ltd.
New Delhi
Website : www.playgroindia.in
Contact Person : Mr. Manu Gupta



The Design Student

Ms. Aditi Parikh
Product Design
School of Planning and Architecture,
New Delhi



Left - a new range of block games

“In today’s changing education system, where there is a rising awareness towards the concept of “learning while playing”, the main focus of the project was on the designing of a toy which helps in the mental and other growth of the child.”

Introduction :

Educational toys for preschool children usually contain blocks of different shapes with connectors. When interconnected to each other through the connectors, the children can make various forms, patterns, furniture, animals, birds, etc by first disconnecting them. The formations made through these blocks, can be used by children and be helpful in familiarising them with everyday objects, besides providing an opportunity for enjoyment with objects of utility that are recognisable for children.

They help in enhancing the imaginative ability of children through abstract formations. Moving, connecting and deconstructing blocks also help in development of gross motor skills and fine motor skills of children, giving them an idea of joinery and mechanism. The objects or animals, made from blocks,

can be used for story telling or theme learning, which can help children to communicate and interact with each other in an enjoyable play way manner, that help in a child’s cognitive, physical and social development.

Established in the year 2006, Playgro Toys India Pvt. Ltd., an ISO 9001:2000 certified organisation, is engaged in manufacturing and distributing children’s toys and playing equipment. The company’s infrastructure comprises of various units such as manufacturing, quality testing, warehouse, research and development.

Aditi Parikh, an independent Product Designer, enjoys designing lifestyle products and childrens’ products with keen interest in working on research based projects, incorporating various craft sectors. As part of her thesis project, she worked with Playgro Toys India Pvt. Ltd. and participated with them in the Design Clinic Scheme.

Design Objectives :

Says Manu Gupta (Director - Playgro Toys India Pvt. Ltd), "Our objective was to develop a toy game which helps in the mental growth of children in the age group 3 – 7, through 'Learning while Playing' for children between 3 – 6 years of age, by providing quality play value to the children, while securing their safety. The toy we believed should allow children to interact and experiment, while providing scope for improving their skills, with fun and excitement."

Says Aditi Parikh (Design Student from School of Planning and Architecture), "We maintained a focus on designing and manufacturing toys which are helpful for the mental and physical development of children, during their early years of learning. Overall, the industry is very interested in developing new concepts with the help of design students."

Design Journey :

Says Manu Gupta, "According to a cognitive theory of child development, children 'construct' their knowledge through 'experiences', provided to them by the physical environment, people and products surrounding them. Toys thus, are said to be of high importance and most influential in the early development of a child."

Continuing, he says, "Through interviewing parents and educators, we understood their idea of 'learning while playing' and familiarised ourselves with the need of

active / passive users and thereby identified the vacuum in the toy market. We selected 14 popular educational toys, which provided various learnings associated with five basic developments. Questionnaires were designed to lead towards the conclusion of specific types of toys preferred by parents and educators and understand the rationale behind the preference for those toys. The survey was conducted in person and also online across 27 participants."

Says Aditi Parikh, "The conclusions, we arrived at were that parents and educators prefer toys which support

cognitive skill development, along with physical activity. Construction blocks are the most preferred educational toys, as they give repetitive use and help cognitive development, improve imaginative skills and provide abstraction of objects. Making something with their hands, assembling, deconstructing and dirtying their hands are some of the enjoyable play times of children, also that physical activity along with cognitive development are preferred."

Adds Manu Gupta, "Two concepts were merged in the finalised version. In the first, one a circle of 400mm diameter was radially developed and the outer circle was cut into 8 segments. The combination of these 8 segments and the circle can create various patterns. In the second concept, some of the organic forms inspired blocks which could be connected together to create various themes related to nature."

Elaborates Aditi Parikh, "The basic circle was divided into four parts and new concepts through geometry

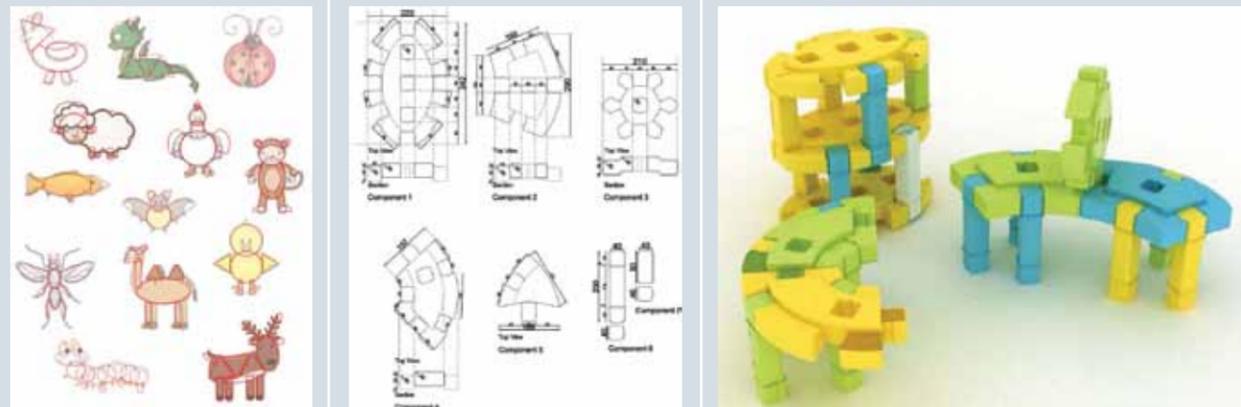
were set up, to illustrate and facilitate learning. The circle, during evolution, was divided into four parts and a new geometry was set accordingly.

The final geometry consisted of five shapes, through which various 3D and 3D formations can be generated. The connections were supported by two connectors of two different sizes, as well as supports for five shape blocks. This was called 'Connectrix'."

Way Forward :

During the thesis stage, 'Connectrix' was developed to a level where it directly went for production. Further refinement occurred during the production process with inputs from the mould maker. It was officially launched in the Nuremberg Toy Fair 2013 in Germany and has thereafter received positive response in the domestic, as well as international market.

Right - concepts, drawings and rendered images prior final product



Advantages :

Says Aditi Parikh, "The learnings, that are expected to accrue, include the basics of mathematics, geometry and balance. Some organic forms were taken as inspiration to make blocks which can be connected together to create various themes related to nature."

Concludes a satisfied Manu Gupta, "The learnings from this include abstraction, imagination, joinery and tactile perception. Children can create various forms like patterns, everyday objects, furniture, animals, birds, etc by connecting them. This helps in familiarisation with everyday objects, besides offering the 'fun' of creating something 'usable' by children. 'Connectrix' helps in enhancing the imaginative ability of children through abstract formations. Moving, connecting and deconstructing blocks also help in development of gross and fine motor skills of children, while giving them an idea of joinery and mechanism. The object or animals, created out of the blocks, may be used for story telling or theme learning which can help children to communicate and interact with each other. The toy helps in the child's cognitive, physical and social development."

Undoubtedly, an effective learning medium through play.

Theft and leak proof Manhole

Efficient protection to critical civic systems



MSME Unit

Crescent Foundry Co (P) Ltd.
Kolkata, West Bengal
Website : www.crescentfoundry.com
Contact Person : N. Pitchaiah



The Design House

Designlipi Projects Private Limited
Kolkata, West Bengal
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Left - new design of theft proof manhole cover

Manhole cover theft is not only linked to the loss of material and property for government agencies but accounts for accidents and loss of lives. A theft proof manhole addresses issues not only related to security but includes factors like reliability and convenience to assure people's safety.

Introduction :

Man hole covers are a critical safety insurance feature in frequently used areas with great wear and tear such as municipal and public places, industry, airports and several others, where critical underground amenities like sewage systems, water and electrical lines need to be kept safe and functional, to ensure a basic standard of living. They are best if easy to install, maintain and durable in terms of longevity and effective use, to meet benchmarks of good quality man hole covers. In public places theft of these man hole covers is a common occurrence and poor quality covers can be dangerous, in terms of causing accidents. Moreover, due to the increasing theft rates, alternate approaches have been adopted and these include concrete manholes amongst others, which have not proved to be successful options in the long run. Considering the extended and critical use of manholes, a theft proof cast iron manhole cover,

which provides safety, strength and ease in operation, undoubtedly is a significant product for offering basic civic efficiency and security.

Says N. Pitchaiah (Head Operations - Crescent Foundry Co (P) Ltd.), "In countries like India and Africa, where we wished to penetrate both the domestic and international markets, it was imperative that this product be theft proof, as the cover itself is expensive and can be stolen relatively easily. Removal and stealing of cast iron man holes is a familiar occurrence, as they have a high resale value. Also, once removed it becomes dangerous for pedestrians as well as vehicles crossing the open manhole, where cases of accidents and deaths because of open manholes, are a tragic commonality. Also," he continues, "they have to be leak proof as these products are used to cover critical and expensive cables and electrical joineries, where contact with water and other liquids is not desired, as it may cause severe faults and accidents."

Says Sanbid Golui (Director & Chief Designer- Designlipi Projects Private Limited), "These key factors, which were absent in the original man hole covers presented specific redesigning focuses in the existing product. We worked on a design, that was intuitive enough for operation by untrained workmen. It was modular and easy to adapt to different shapes, sizes and product models, with its functional and reliable design." To sum up Sanbid says, "We realised the design should be simple, easy to manufacture, easily assembled on site and cost effective."

Says N. Pitchaiah, "The earlier shortfall was casting as the manufacturing process, heavy weight of

components and simple locking solution of key and lock was impractical."

Designlipi Projects Pvt. Ltd. is the first of its kind in eastern India, offering comprehensive design solutions in the domains of products (concept to reality), packaging (structure and graphics), branding and communication, retail experience, research, strategy and innovation.

Crescent Foundry Co (P) Ltd. was established in 1980. They export most of their castings to 45 countries as leading manufacturers of grey and ductile iron, municipal castings, counter weights, agricultural wheels, industrial castings and accessories in one place.

Design Objectives :

Says N. Pitchaiah, "We asked Designlipi Projects Pvt. Ltd. to work on making man hole covers leak proof in the background of huge wear and tear, through usage and exposure of very rough and heavy materials, exposed to outdoor vagaries of environment like heat, cold, UV and other adverse weather situations."

Adds Sanbid Golui, "We proposed to go back to the basics for finding very simple yet feasible solutions, rather than employing a conventional techie design approach, considering the product, usage, environment, manufacturing, materials, process, cost and market."

Design Journey :

Recalls Sanbid Golui, "After visiting the site and a couple of rounds of discussion with the R&D team and identifying the need (marketing) and problem areas, we found that, as a human being and engineer, whenever we think of 'locking', the solution visually is to have a 'lock and a key' with a common key, difficult to duplicate and usable for specific manholes usually available with an authorised service person in possession of a master key, which can open all the manholes in a precinct, similar to hotel room key systems. Another solution visually was to create a special fixture tool, other than a key, to open the cover."

Says Sanbid Golui, "In the redesigned manhole cover, the hinge was designed to penetrate and lock inside a pocket of the frame, with the help of a small connector. This was integrated with an expansion bolt and supported by features like a self-locking tilted cover."

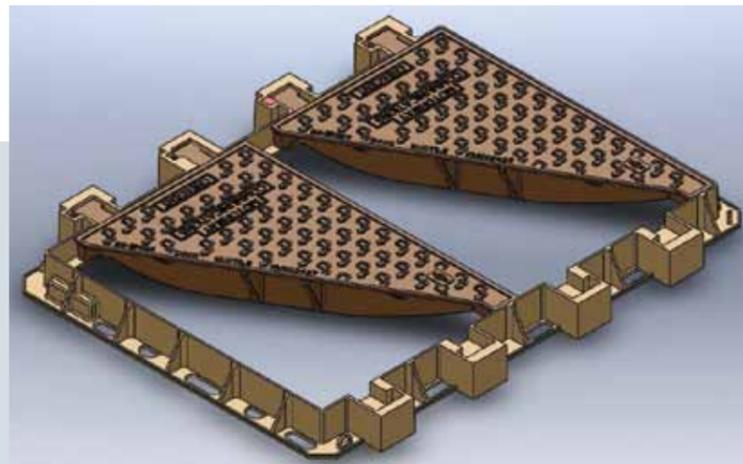
In the case of a leak proof reinvention, the design evolved with the client, to create a passage of water in the hinge location. Instead of an introduction of a rubber gasket, this simple solution helped protect from

damaging the materials and electrical equipment placed inside. It solved the purpose and saved on the cost of the product, as well as its maintenance expense."

Continuing N. Pitchaiah elaborates, "There was a restriction created by an in-house manufacturing capability and resource crunch. There was the issue of a huge product portfolio and variety of applications, augmented by material constraints, installation process limitation and an environment and usability restraint. Transportation and installation difficulties remained the other issues."

Way Forward :

Observes N. Pitchaiah, "The final product has been prototyped and a certain amount of clarity achieved. As our unit's sale efforts are in progress in the domestic and overseas markets, there have been queries from customers which need to be addressed for further development. Even though final production has not been achieved thus far, we are confident of the redesigned product's potential."



Right - rendered images and final product

The Advantages :

Says N. Pitchaiah, "The advantages that emerged out of the redesigning effort included it becoming a theft proof manhole cover with an inbuilt solution, without any extra components, at a cost easily offered to African countries as well as India, where stealing manholes is a big problem. Moreover, the design is very simple, easy to manufacture and assemble on site."

Concludes Sanbid Golui, "There were various challenges faced during the design process, to achieve the desired objective. There was a huge constraint in the current manufacturing process and achievable accuracy in casting. Installation and maintenance was done by highly unskilled people that had to factor in the reality, that countries like Africa and India can't adopt a highly technical solution, where there is a basic need for simplicity."

Domestic and Commercial Water Purifier

An efficient, chemical free, membrane based system



The MSME

Membrane Filters (I) Pvt. Ltd.
Pune, Maharashtra
Website : www.membranefilters.in
Contact Person : Mr. Shubash Devi



The Design House

Lokus Design Pvt. Ltd.
Erandwane, Pune
Website : www.lokusdesign.com
Contact Person : Chandrashekhar Badve



Left - membrane based water filter system
Right above - old water purifier

The design intervention focused on a spectrum of aspects including engineering, that took into account tolerances and finishes that considered existing component specifications and mounting details, also other technical and mechanical constraints, besides regulatory issues related to enclosure design



Introduction :

The chemical water purifier, with the housewife multitasking and lesser time to devote to kitchen activities, a steady supply of water, a most essential element for survival, needs to be accessible in wholesome quantities and pure food safe forms. Water sources being numerous namely rivers, lakes, ponds, municipal sources, harvested rain water, that require elimination of microbiological and viral contamination including rust, dirt, metallic particles, algae, worms, cysts of amoeba, bacteria and viruses hepatitis 'A' & 'E' are essentially all bearers of water borne diseases.

The membrane based domestic water purifier system does not kill or inactivate bacteria and viruses, but physically removes them with the use of Indian and US patented technology of ultra filtration. It gives superior quality and safety in drinking water and encourages one highly effective membrane with millions of minute ports to exclude disease causing germs, bacteria and viruses.

Reflects Shubash Devi (Director – Membrane Filters (I) Pvt. Ltd.), “The initial offering with the original design of the domestic water purifier, included slow purification and flow rate, with disproportionate occupation of platform space. Besides, there was the issue of consumer behavior with an established preference to buy a new type of purifier, a situation further compounded with the absence of resale value.”

Elaborates Chandrashekhar Badve, (Founder Director - Strategy and Marketing Lokus Design Pvt. Ltd.), “The challenge at the beginning was to identify how we could develop a unique product around technology, that will reduce the end user cost to less than Rs.1,000/- and at the same time improve usability, consume less capital investment for moulds and manufacturing. And at the same time make it an iconic product that would present a strong brand image.”

Membrane Filters (I) Pvt. Ltd., a Pune based MSME commenced operations in 2003 for mass-scale manufacture and commercialisation of membrane based filtration and purification systems, by becoming a non-exclusive yet sole licensee of the membrane technology, created at National Chemical Laboratory (NCL), of the Council of Scientific and Industrial Research (CSIR), Government of India.

Lokus Design Pvt. Ltd., a leading brand strategy and design consultancy, works with some of the world's premier companies and organisations to create truly innovative and pioneering brands that succeed and endure in a dynamic world.

Design Objectives :

Says Shubash Devi, "Our primary objective was to develop a unique aesthetic language for patented membrane technology, to enhance utility of the product architecture and features to improve the effectiveness of the product, for tier II and tier III users. Also, to design for manufacturing and assembly in the current context, with special reference to domestic as well as commercial environments in India. It also aimed to explore possibilities of meaningful value additions like a unique 'flush indicator' to economise on wastage, maintain optimal water quality through accurate indications and enhance perceived value and therein brand trust worthiness."

Summarises Chandrashekhar Badve, "To make this patent safe and affordable, an objective of design intervention was to ensure that purification technology be usable, desirable and available to every Indian home, to channelise energy resources. An effort, that would receive support through visibility, via an effectively designed visual communication."

Design Journey :

Based on an initial understanding, Lokus Design Pvt. Ltd. went through systematic planning, prior launching into the actual redesigning process. In phase one, they developed the design specifications, in consultation

with the MSME team members from various departments. The market research was conducted across Philips, Whirlpool, Hindustan Unilever, Kent, Eureka Forbes, Usha Brita, LG and Zero B. Phase two entailed detailing of the preferred concept and mockup

Right - new design with compact structure, wall mounting



creation, to graduate the concept to the next level and reduce overall risk. In phase three, the selected concept was refined to suit the selected manufacturing process. In phase four after approval of basic engineering details and logic, they made one prototype in HIPS to validate basic functionality and usability as per requirement specifications. The final phase saw refinements based on product validation and testing, where detailing of all parts was undertaken.

Adds Chandrashekhar Badve, "Membrane based water purification technology is the safest available technology and it doesn't require electricity and filtered water storage system, which leads to a greater space and cost requirement and regular maintenance. Its recurring cost is very low as compared to other available filter that needs replacement of modules after every 2-3 months costing INR 250/- to 350 /-. Membrane filters need to be replaced once a year with zero maintenance cost."

Says Shubash Devi, "The unique tap design augments product visibility in a crowded market place. The concentric filter geometry with patented filtering

material enhances effective filtering and minimises the BoM, where the new geometry uses less than half the material for the same filter life-span. Enhanced user interface with innovation in form as well as adaptation of off-the-shelf tap, support its competitiveness with international options, helping it to stand out in a crowd. The subtle curves lend an air of authenticity and appropriate division of form, enhancing its attractiveness, soothing neutral colours with striking blue strip accent, providing the necessary contrast to make the product interesting. "

Way Forward :

Predicts Chandrashekhar Badve, "The expected quantum of production of the redesigned domestic membrane water purifier is 3000-4000 units in the first year." The cost of the redesigned product is Rs.4,400/- (manual flush) and Rs.5,400/- (electric flush). Older clients of the manufacturer have approached them for exchanging their old machines for the new one. Membrane Filter Pvt. Ltd. is surely on its way to establishing itself as a brand in the consumer market with simple design leading to increased profit margins.

The Advantages :

Says Shubash Devi, "The new design has a two way, aesthetic as well as manufacturing advantage. An optimal number of parts with only two splits, simple surface geometry with uncluttered internal layout led to low overall costs. The small size helps the consumer, manufacturer and transporter with the geometric form to convey robustness and reliability."

Continues Chandrashekhar Badve, "The wall mount easily integrates with tight spaces in the kitchen. The user interacts through the enhanced tap design, that simplifies usability. Intuitive and simple, the drain makes the mandatory daily back-flush simpler. Easy to maintain and clean, quick to open and close, no clutter enables effective cleaning. Patented filter material (US and India) enables effective manual filtering without chemicals."

The new design solution challenged the traditional thought process of Membrane Filters Pvt. Ltd.. The design solution has increased acceptance of the product in the market vis-à-vis international brands and new markets have opened up due to the novel design and look. Significant success within a quarter of a year of the launch, has encouraged market response and led Membrane Filters Pvt. Ltd., to set up an entirely new manufacturing plant.

Handmade Home Décor Products

Ceramic and glass magic with utility



The MSME
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Website : www.windglaze.com
Contact Person : Puneet Brar



The Design Student
Mr. Deepak Vishwakarma
Ceramic and Glass Design
National Institute of Design,
Ahmedabad



Left - decorative ceramic lamps,
lighting from fired clay

“The ideology behind pottery is to create products that one decides to live with, rather than acquire. Objects that have a presence and a character, that share spaces with one and are not based on function alone or, on trends to render them meaningful. It makes one think about and question the way they are treated, the time spent with them and consequently the quality of life.”

Introduction :

The medium of ceramic was a popular one for utilitarian products in Indian homes, in unattractive forms and prosaic colours. However, with the increasing popularity of ceramic products in the west, the medium took on attractive shapes and colours and moved into the space of *object d' art* from utility. Their relatively hardy, attractive and inexpensive features make ceramic products a popular proposition, from a house and office proud individual's perspective.

WINDGLAZE is a ceramic studio, based in Pondicherry. Their products range from mosaics for the bathroom, kitchen and flooring to also include tiles, murals, décor, aromatherapy, tableware, for the bathroom and one offs. The products are sold locally and exported while undertaking specific design and manufacture commissions for homes, restaurants and others. The studio works in two temperatures, catering to product materials ranging from earthenware to stoneware.

Design and Roots, a boutique studio led by Deepak Vishwakarma, offers varied services that bridge the gap between design, craft and art, creating beautiful yet functional products. The studio offers services in installation design, sculptures, relief work, murals, tiles, lighting etc., with varied materials and techniques, specialising in glass, ceramics, terracotta, stone ware also basic metal and wood work.

Recalls Puneet Brar (Proprietor - WINDGLAZE) “The Areas according to the initial survey that demanded immediate attention are festive gifts which are sourced by corporates for their international visitors, hotels for return gifts to their guests and individuals, during special occasions like weddings or Diwali. They include products such as containers for chocolates, candles etc. The criteria, we redesigned were beauty, uniqueness and utility. Besides gifting, these products are also bought by people and tourists as souvenirs for personal use or home décor.”

Design Objectives :

Says Deepak Vishwakarma, "For this project, we planned to focus on handmade home accents for festive gifting and souvenirs, with a predominant Indian aesthetic. The project objective was to understand the existing ceramic studio scenario, their vision, demands, requirements, production process and setup. Also advantages and limitations vis a vis existing market scenario, consumer and user needs and constraints in material, techniques etc. The understanding and addition of one's own learning added to the studio, in terms of a new product range. The idea being to work on a live project, understand the intricacies involved in the functioning of a small scale set up and then eventually to apply one's design sensibilities."

Design Journey :

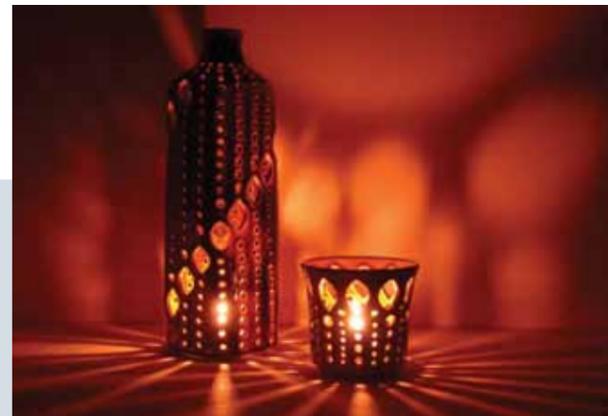
Says Puneet Brar, "Based on the market survey, I extended the study across a large variety of home décor products, such as vases, lighting (also lamp bases and shades), partially utilitarian products like fruit bowls, serving plates, mugs for special occasions such as corporate gifting, festival gifting etc. At present, as seen in the market these products are imported from east Asian countries like Thailand, Vietnam, Turkey and Poland in Europe. They bear a generic aesthete, or are clearly reminiscent of the specific culture of that country, especially products from Thailand. It is evident that for Indian occasions or for the Indian corporate, there is no particular product that reflects the vast cultural and aesthetic quality of India. Design intervention we realised, could either be done on the surface of existing products, or

in their forms and shapes, both being inspired by the Indian aesthete. One could see a clear demand for this category that also proposed the use of indigenous materials and skills, along with our design sensibility that could create a unique product range and be utilitarian, without compromising on the décor value of a well designed product."

Continues Deepak Vishwakarma, "The product range, I realised could be extensive, including customised mugs and even lighting. After my visit to WINDGLAZE studio, I realised that they work in a number of areas, using various methods of production which are predominantly based on hand skills that would enable me to design, within the given time frame of the diploma project, a number of products. My proposal was to design at least three products that could be market tested during this period."



Right - another range of ceramic lighting products



Above - owl, an innovative mug and lighting product

He adds, "The tangible deliverables that we identified included material innovation (clay body and glaze) and exploration (concepts and forms), production aid and enhancement (if possible, in terms of efficiency - which required skill enhancement of the artisans for the production of the developed range), working concepts to create a collection of products in stoneware earthenware according to the given brief, followed by documentation of the entire project."

Says Deepak Vishwakarma, "The methodology followed, included creating a project brief. The initial research sources included books, internet field study an understanding of the existing studio functioning, market potential, user aspirations and other related aspects."

Continuing he says, "The working brief included identifying opportunity areas, analysis of the above in order to have a redefined project brief, explorations and concept generation through sketches, material explorations, models etc. The product detailing included form finalising, surface treatments, material specification and standardisations. Prototyping, costing and testing the product in the market were the other significant steps."

Recalls Deepak Vishwakarma, "I thereafter created a design intervention plan, where at the product level,

I decided to focus on surface decoration of existing products and designing appropriate forms and shapes, inspired by the Indian aesthetics. At the process level, my hand skills, software knowledge, visualisation capacity etc. I realised that processes such as prototype development can be hastened up by using techniques I have learnt and people can benefit, by refining and upgrading their existing skills, by using upgraded, contemporary knowledge of hand skills and tools."

Elaborating Puneet Brar says, "The techniques we employed in clay hand work included 'pinching and coil', which required high skill, exclusive products and slab, that called for a fair level of skill and batch production. The 'wheel work' entailed 'throwing' that requires high skill and mass production, also 'jigger and jolly' that require fair skill and mass production. 'Slip casting' included 'form' and 'mould' making to create exclusive pieces."

Way Forward :

Immediately on completion of the project, 'Fabindia' placed the very first order for lamps designed, with their valuable vendor WINDGLAZE. The consignment entered the market in December 2013 and enjoyed a good market response. This was followed by the owl mugs.

Advantages :

Says Deepak Vishwakarma, "In the ambient lighting project, the fitting option included a hanging on the wall, with a light wooden fixture, placement of the light on the fixture priced at Rs.150/-. In the cup project, a handle less cup that integrates the handle with the form incorporated the convenience of the feature into the main form itself. The attributes of the owl mug are that it is small and handy, easy to install, is available in many colours, is cleaning friendly and wonderful for gifting or for personal use."

Craft Kits for Children

Play and learn, and learn forever



The MSME

Creative Educational Aids Pvt. Ltd.
Greater Noida, U.P.
Website :
www.creativeeducationalaids.com
Contact Person : Ajay Kumar



The Design House

January Design
Gurgaon , U.P.
Website : www.januarydesign.com
Contact Person : A. Balasubramaniam



“Any learning included in an enjoyable environment remains that much more deep rooted and useful in the long term. In an era, where bookish learning has stunted creativity, such an exposure will undoubtedly give impetus to a “real” and meaningful learning environment, that will encourage innovative thinking through creative exposure.”

Introduction :

Play and learn kits serve an important and unique function in that children can, through the medium of play, acquire skills that support a variety of basic dimensions of formal and informal education. Craft kits are activity-based kits that offer a solution to boredom. Parents are forever looking for activities that wean children away from television and keep them actively engaged, for the greater part. Craft kits can help children become creative and help them build their fine-motor skills and dexterity, that gives them the satisfaction and confidence of building something with their own hands.

The activity kits available in the market today typically either repeat the few tested ideas and encourage superficial handwork, ignoring basic learning.

Indeed, their importance cannot be underestimated in an environment, where having an ‘edge’ is a necessity, rather than a preference.

Says Ajay Kumar (Director - Creative Educational Aids Pvt. Ltd.), “We realised that there was a need to re-visit the category of products and design a new range that

is contextual in today’s world. It was evident that there was an opportunity to teach children through kits, concepts like environmental sustainability, scientific principles and even promote traditional crafts. It was also important to design a range of products to create an impact in the market.”

Says A. Balasubramaniam (Director - January Design), “The MSME unit was looking to utilise their capabilities of building board games and puzzles in newer areas. There is always a need to look for refreshing new categories that will attract new markets and the Educational Aids Pvt. Ltd. was naturally hoping to encash in on these new opportunities and expand their product portfolio.”

Continues Ajay Kumar, “Moreover, these games help children in developing their general knowledge and intelligence. These games are very popular amongst children, parents and educationists in India, as well as abroad. Our range lacked a craft series in toys for older children. There was a need for a designer who could conceive and visualise a new product range, hence we needed design assistance and opted to move with the Design Clinic Scheme.”

Left - new range of board games and toys.

Recalls A. Balasubramaniam, "Moreover, there was very tough competition in the market for Creative Educational Aids Pvt. Ltd.'s general range of products."

Creative Educational Aids Pvt. Ltd. (1987) was incorporated with the objective of carrying forward the business of Educational Aids i.e. Children's Games and Puzzles. Immediately, they established their lead position in producing innovative games and toys for educating young children. The company is producing

and marketing more than 300 products, from Greater Noida at present.

The Design Consultant A. Balasubramaniam, has been involved in design projects and institutions since 1985. A respected member of the design community, he set up January Design studio in Gurgaon. He has successfully completed projects in the areas of product design for large, small, micro and craft sectors.

Design Objectives :

Specifying, A. Balasubramaniam says, "The purpose of the exercise is to identify suitable age groups for children and design according to their development requirement. Buyers of these products can be parents, relatives, friends and classmates who mostly always want to be seen as gifting something valuable and educational."

In essence, the objective of project was to design a set of craft or activity kits for children who are increasingly digital-savvy. The design of the kits had to be such that excited users and helped them remain focused and engaged. The assignment involved understanding requirements and developing concepts that are new and attractive."

Design Journey :

Phase wise, the design preparation process began with the user and use research segment, that extended over two weeks, the concept development phase over four weeks. Prototype and testing of the new products and packaging were done with actual or mock-up materials. These were tested on user groups for feedback and iterations. The final artworks and engineering drawings were submitted after one week, post finalisation of the prototypes in the final phase

Recalls A. Balasubramaniam, "User research findings were tabulated basis typical user groups, also parents, teachers and 'gifters' to establish what is considered safe, entertaining and involving for children, in a format that established new product categories. Visual renderings of about six new products and corresponding packaging designs in the new category were created. Prototypes and packaging designs were developed, along with user manuals of all the products and technical specifications of approved design ideas."

Elaborating further Ajay Kumar says, "Eventually, it was decided to create six kits of a batch of 3000 pieces each, to be manufactured in the first phase."

Way Forward :

Says Ajay Kumar, "Design Clinic Scheme is a very good and effective scheme of the Ministry of MSME. We had very good experience working under this with the designers and the outcome has been very satisfactory, with the production of a comfortable range of products. Going forward, we would like to create a range of education board games, under this scheme."

Continuing he says, "We have showcased the new craft kits in exhibitions and received a very encouraging response. One of the kits is already selling in the overseas market and very soon, the entire range will be available in the domestic market as well."



Right - a pack of World Wiggles
Extreme right - a complete design solutions outcome



The Advantages :

Says A. Balasubramaniam, "New products were created to engage both genders. They were educational, interesting, stimulating and designed for prolonged play value, beyond the contents of the kits."

Adds Ajay Kumar, "As a result we created new thematic kits namely, Kites of the World, Warrior Wiggles, Disguises, Roleplay, Let's Celebrate Diwali and Let's Celebrate Halloween."

Toilet Flush

Efficiency and hygiene through foot pedal



The Design Student
Prakhar Pandey
Mechanical Engineering
ITM University, Gurgaon



Left - foot operated flush design for improved hygiene and water saving

“As per the roadmap for rating system for water efficient fixtures by Centre for Science and Environment (CSE), developing and promoting water efficient technology, setting standards for performance and measuring efficiency according to new standards would lead to reduction in water use across all types of buildings.”

Introduction :

As is a well known fact of most utility products, toilets too, across the globe are in a stage of evolution. For ‘developing’ India, the standard of living needs to be improved and a significant criteria for determining the standard of living of communities, is reflected through the development level of basic functional spaces like the toilet, bedroom, kitchen etc. The toilet flushing, water usage, hygiene are part of this and need to be enhanced not only in homes, but also in various public places, hospitals and other such.

In a typical situation, during flushing, generally the hands are used. When the hands come in contact with the flush lever or button, the transfer of bacteria takes place creating a hygiene problem. Toilets are used for the disposal of two kinds of wastes namely solid and liquid. Solid waste needs a good amount of water approximately 6 litres, and not so much in the case of liquid wastes, which requires about half the amount.

The toilets are used more frequently for liquid rather than solid waste, which means that a large amount of water gets wasted everyday and compounds into a big problem.

Prakhar Pandey an ex-student of ITM university and now co founder of Universal Wisdom Engineering Solutions (UWES) has been working in the field of design and is also associated with the Design Clinic Scheme, as an independent Professional Designer and through NID’s Delhi cell.

Ashwini Sharma, Assistant Professor, ITM University has mentored many student projects under Design Clinic Scheme of MSME, delivering seminars as a design expert at Design Awareness programmes and evaluator of Design Clinic Scheme’s professional design projects. He is an active member of SAE, IIIE, ISTE and DCS as a design consultant. Furthermore, he has successfully developed prototypes for eminent automotive brands and personal utility products.

Design Objective :

Says Ashwini Sharma (Assistant Professor - Mechanical Department - ITM University), "The aim of undertaking the redesigning process, was to design and fabricate a foot operated toilet flush system, which reduced wastage of water during the liquid waste flushing, besides improving hygiene during the flushing practice, as a good replacement for the conventional hand operated flush system and in that making it more hygienic and popularising it."

Design Journey :

Recalls Prakhar Pandey, "An in depth summary of existing toilet flush systems formed the basis of our study. We studied and evaluated different products and parts available in the market. The assessment also illustrated the problems faced by people while using the systems, and also their method of use. The general survey we conducted included the study of different flushing mechanisms, cisterns, toilet seats, as also the flushing practices of different people, user interaction and their needs."

Says Ashwini Sharma, "As per the initial research, it was observed that in the gravity type single mode flush system, the lever is pushed, the water exit opens and water is released. When the cistern is empty, due to gravity the exit of the water closes. The float is also installed to avoid the overflow of water from the cistern. This type of system is generally used because it is cheap and efficient."

Adds Prakhar Pandey, "In single mode gravity type systems, a simple accessory was installed without changing the internal mechanism of the cistern, to convert it into dual mode i.e. water efficient. This is finally connected to a foot operated pedal. The variety of pedals has been created according to different types of toilet seats and installation locations."

Continuing Prakhar Pandey says, "After interacting with different users of different age groups, we concluded on a few relevant facts namely, people do not prefer to use their hands while flushing, there is occasionally a need to flush while sitting as well, because sometimes there is a requirement to flush more than once during the activity. This interaction further emphasised that people are concerned about water saving and hygiene. The initial design focused on a foot operation flushing system and the other on an internal cistern design change, for dual flushing."



Above - concepts and rendered images of paddle operated flush

Says Ashwini Sharma, "The product was designed correctly and readied to forward for prototyping and use. It was redesigned in a manner that the wire protruded because of relative inflexibility, besides the cistern plug did not work with the foot pedal."

Adds Prakhar Pandey, "The focus during prototype selection was to operate it by foot, so that problems of water saving and hygiene could both be addressed, by a single product. Various designs were created for tackling the problems and the best three were selected. One prototype had western seating with manual water saving mechanism, operated by foot and equipped with a foot rest. The two different prototypes have automatic water saving mechanisms, with different flushing mode foot pedals. These two are compatible for both western, as well as Indian seating. Hence, the objectives were achieved by making it foot operated and therefore hygienic, with dual flush mode and so economical on saving water consumption."

Continuing, he says, "The high precision 3D laser scanner with the dual CCD technology was used to

measure the original design sample of a siphon jet toilet. The digital toilet model was constructed from the cloud data measured, with the curve and surface fitting technology and the CAD/CAE systems. The k-double equation model of the turbulence viscosity coefficient method and the VOF multiphase flow model were used to simulate the flushing flow, in the toilet digital model. Through simulating and analysing the distribution of the flushing flow's total pressure, the flow speed at the toilet-basin surface and siphoning bent tube, the toilet performance can be evaluated efficiently and conveniently."

Way Forward :

Summarises Ashwini Sharma, "The recommendations for future work incorporate water efficiency and hygiene. There is a further scope for solution of these problems by changing the design of the seat, including its nozzles, functional design and pipe shapes, that will result in less splashing and more area coverage, leading to less use of water and increased hygiene. This can carry toilet flush technology to the next level."

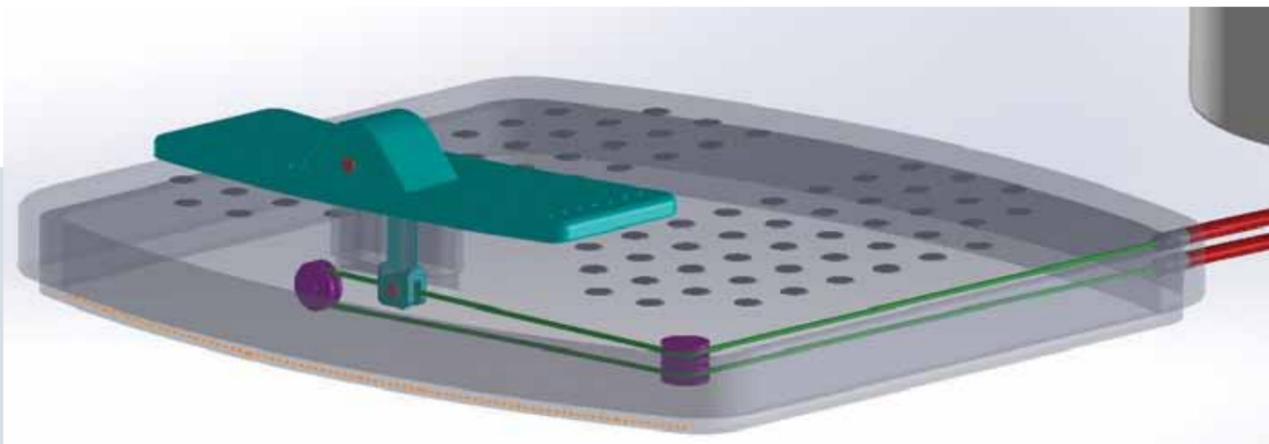
Advantages :

Concluding on the outcome of the design project, Prakhar Pandey says, "The new redesigned toilet flush system has helped in increasing the standard of living of the Indian society and saving water, not only in homes but also in corporate and other work places."

Adds Ashwini Sharma, "The foot operated pedal mechanism with dual mode for flushing, imparts good working efficiency with great potential, as the requirement is significant with scope of great work. It was therefore suggested that the flushing mechanism is the more efficient one, as efficiency is related to flushing with per unit water consumption and the flushing practice effective, as it is related to hygiene as incorporated with foot pedals of a wide range."

The redesigned toilet flush system helps in facilitating functioning at a grass root level and increasing the standard of living of the Indian society, at a macro level. The flush pedal is connected to the system by a wire and it can be adjusted at any side of the toilet seat (Indian or western) as per requirement. The pedal adjustment has the freedom of attachment in every system, and can enhance the ergonomics, offering different configurations as per requirement."

Below and right - virtual ergonomic model and 3D mechanism



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