



**a design perspective**

**selected papers by the faculty  
industrial design center  
i.i.t, bombay**

**idc publication  
march '97**





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*A Design Perspective* is a collection of papers by the IDC faculty specially written for national and international conferences and seminars. With the need to expose these topics to the interested reader, especially our alumni, this publication was synthesised.

It is a diverse collection based on the vast experience, practice and research of the teaching faculty of IDC. With the buzzword of today being globalization, issues related to design, especially in the context of India and other developing countries, have been opened and analysed. The acceptability of global culture products in traditional societies, the need for environmental design and signage and a fresh approach to craft in developing countries are sought to be explained. Imperatives for having design as a state policy to integrate it with science and technology have been elaborated.

With design research still being a fledgeling field, it is essential that design institutions be kept alive and alert with design research activities. Such publications at regular intervals will serve as a platform for exchanging views with other design institutes.

It will be my pleasure to bring out this publication during the occasion of the 8th Design Degree Show *Manthan '97*.

Prof. S. Nadkarni

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# DESIGN AT CROSSROADS IN INDIA: THE CHALLENGE AMIDST CONFUSION

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Sudhakar Nadkarni

Guest speaker at IFI (International Federation of Interior Design)  
Conference on theme 'Next Wave' at Nagoya, Japan - 2-3 October 1995

## Abstract

*Nowhere is a sense of transition more painfully apparent as it is in India today. This transition arriving on the crest of time and spreadheaded by technology as anywhere else, marks for us several changes: old to new, rich to poor and poor to rich, rural to urban, rusticity to chicanery and most of all... natural to the artificial. While we welcome change as the harbinger of progress, we hold our own reservations about what this bridge*

*to transition must be.*

*I should, therefore, like to enlist and expand on my country's design education and opportunities purely within the framework of how technology has traditionally positioned itself in our culture i.e. in obeisance to nature and not vice-versa. From their onwards I should like to provide an inner view into why rapid technological progress as a*

*way of conquering the earth stands in opposition to our cultural mind sets that nature stands in harmony with man, not in discordance. I also recognise that as the world opens up through the satellite skies, we begin to embrace each other's worldviews. The challenges to our design education arise precisely out of this situation that today threatens to wipe out our non-manifest worlds, leaving the manifest world like a gaping wound.*

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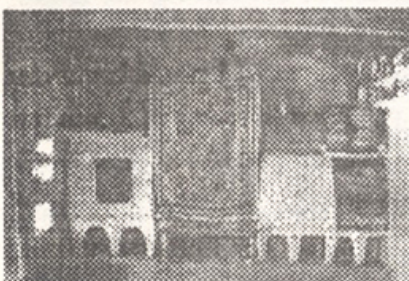
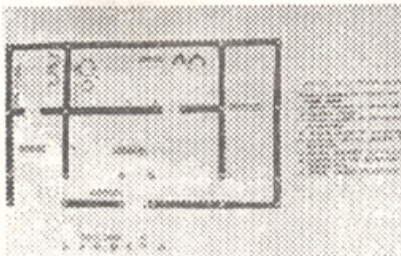
I come from a land where once upon a time, man and nature were so intimately tied up with one another that we derived our gods and goddesses from 'prakruti's' (i.e., nature's) lap — the snake, the tree, the rain, the elephant, the swan, the owl, even the unseemly rat. We associated our own survival with a friendly communion with nature's elements — 'akash' (sky), 'agni' (fire), 'vayu' (wind), 'prithvi' (earth) and 'jal' (water). One never deemed it fit to try and gain supremacy over these. What our scriptures did ask us to control was our ourselves. Which translated itself into a certain reconciliation between our thoughts and our actions. Hence came the need to firstly control the five 'karmendriyas', viz., the organs of action; and thereafter, the five 'gyanendriyas', viz., the organs of senses. If and when any one of us came anywhere close to a convergence of these two groups of senses, that (for us) spelt completeness of existence.

Today this set of affairs seems like a distant, remote condition across much of the country. My attempt will be to place before you the current situation, and consider if this is a logical extension of our earlier cultural evolution; or whether the present situation is actually a rude snapping away from our past attitude and is, instead, the result of excessive human intervention through indiscriminate use of technology specifically with the intention of subverting the larger scheme of affairs provided by nature. And perhaps the fallouts may now force us to arrive full circle to our earlier cultural 'mind sets'? I shall also move away from this level of abstraction towards the more specific matter of what constitute my views as a designer in the area of design teaching in transition. And further progress into what perhaps might be done about it. I shall do this by using the specific instance of my immediate life experience as well as my years in the profession of design.

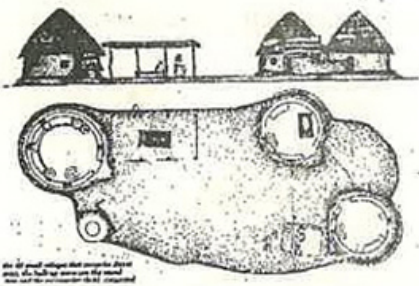


First and foremost it would be necessary to consider the status of design in the broader context of a country's level of development. It seems appropriate to quote from Tomas Maldonado<sup>1</sup>: "The discussion of nondesign is an intellectual luxury of consumer society, a prerogative of well-to-do peoples, the rhetorical pomp of peoples saturated with goods & services. People submerged in indigence & need cannot permit themselves that luxury. For them the will to survive is identical with the will to design, because for them, designing means supplying themselves with the basic weapons against the repressive hostility of indigence".

In other words, I would disagree with a common misconception held by many from developing societies including ours, that design is a non-starter of an issue; that design is of no consequence as long as half the country's population remains under the poverty line. For me, on the contrary, design could provide us the cutting edge that could transform our way of looking at resource utilisation, and that could help deliver scarce resources to as many people as possible. But most of all, one must try to understand the moorings that design already has made in the cultural existence of its people. My proposition here is that, much of the corruption of life through technological intervention has occurred in the urbanised setups of my country, whereas in the countryside people still attempt to remain relatively close to nature and continue to take their aesthetic cues from this kind of connectedness. We, therefore, have to wonder how to arrest those influences from the cities that will inevitably one day snap these already frail ties altogether.



To illustrate the above connectedness, I give the example of the Rathva & Bhilala tribes (from Western India - and there are many such others in pockets across the country). These communities have worked out living spaces in their everyday lives, whose configuration not only allow for human habitation but at the metaphysical level, also the habitation of their deities and their demons. For after all, what are these but the various moral sides to the human mind! In the case of the Rathvas and the Bhilalas, the wall that separates the outer space (verandah) which is also a predominant living area, from the immediate inner space (kitchen) merits the depiction of their gods. This by means of colorful paintings. While the walls dividing up other spaces and considered less important are where their ghosts and their deified ancestors get to be figured. In reality, these depictions are merely the outward manifestations of these people's inner uncertainties or joyousness about nature. Since nature was so overwhelmingly present in their lives, the way to internalise its vagaries and beauty was by worshipping, exorcising or by celebrating it. The aesthetic expressions of such feelings of joy and insecurity were exhibited, and not privatised for personal consumption; and nourished as live-in elements of one's impending realities, something



an old village that survives only with the help of the state and the world.

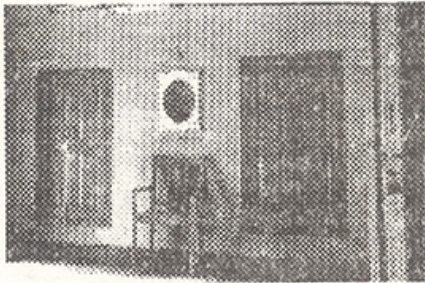


that also helped to provide cues for resolving crises such as diseases, epidemics, loss of cattle or property, or the failure of harvests. It must be said here as it has been said by many others before, that no one can deny these people's native understanding of their realities. While people from hostile desert environments such as in the village Banni of Rajasthan in north-western India built circular houses with available material such as mud and thatched roofing, those from rain-soaked Kerala on the south-west coast of India turned out houses with 'upturned, horned roofs' in deference to the availability of the one piece of resource available commonly and in plentiful, viz., bamboo. This is not only true of India but also of China, Peru, Japan, Egypt and Iran among others, where, in eminent English-born Indian architect Laurie Baker's words "our 'backward' ancestors had learned how to live with and cope with the problems of climate." The movements of air currents, principles of insulation, surface material use, the thermodynamic properties of natural materials — wood, laterite, brick, stone, mud; all this formed their knowledge base. Their native understanding built assiduously over the centuries through a communion with nature, prevented them the abuse or subversion or subjugation of nature.

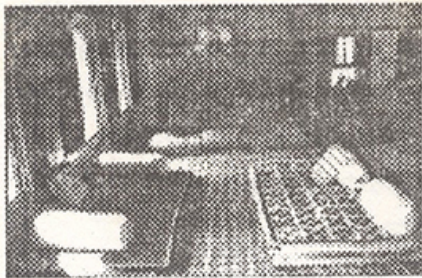
Obviously with the entrance of technology in whatever form or scale or level, matters have not remained so native or 'primitive'. Nonetheless, in India a certain attitude of synergesis continues to exist in people's minds even in the transition of space between the rural and the urban. Here, one still finds the ardour with which the entrance to one's house is announced. Such an announcement being important because this constitutes an entrance and an invitation for entry for the gods themselves. In a ritualistic extension, the tradition continues to persist even in many urban homes today.

But the crux of the transition is to be found in the cities and for which I figured that the best way for me to project the urban situation would be by recounting my personal experience. I grew up in one of the largest cities of India: Bombay. A city that today competes in real estate prices with cities such as Tokyo and New York. This unhappy picture is an extension of what existed (in reduced intensity) even while I was growing up. We lived in a 'chawl' — a typical Bombay term for a rooming-house as against an apartment house. My chawl was situated in a three-storeyed building that housed twelve families in twelve rooms of 10' x 20' size, and which had their toilets and washrooms in common — one set for each floor. Our joint family consisted of my parents and siblings (two sisters and a brother) and my uncle and his children. This was excluding the cousins who arrived from their villages from time to time to study in schools in Bombay. Given the size of the family and the ubiquitous presence of these cousins vis-a-vis the size of the 'chawl', one was logically led to dividing the same living space into spaces for different functions at

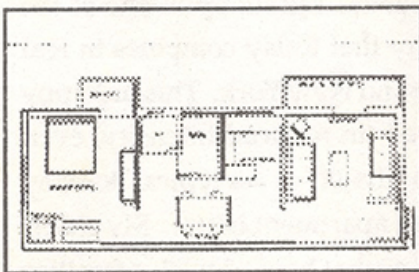
different times of the day or night. While the room served predominantly as a kitchen and dining area in the day time, it would get converted into sleeping quarters by night, facilitated by a terrace extension that provided additional place for sleeping in all seasons except during the rains (between June and September). Within the internal configuration of the house, the pride of place went to the gods — the idol of Shiva and His family, placed in reverence in one corner of the kitchen. While the walls were usually occupied with pictures of gods and our ancestors, the floor would consist of no more than a couple or three of the most essential pieces of furniture (a table, a couple of chairs, a cupboard and about four shelves for storage). What seems worthy of mention here is the fact that much of the decor inclusive of the paint color and consistency for the walls (light green, light blue or light yellow) and the powder, water and glue mix that went up as the final paint seemed a carry-over of one's influences from the village environment. Further reflected in the decorations that were put up to announce the arrival of each festivity (usually dotted all through the year). And also undoubtedly in deference to the myths celebrated in one's original rural environment. Secondly by the habit of recycling and reuse, one was able to lend a certain sense of simplicity rather than clutter to this decor. And what better way to respect the fact of scarce resource availability!



Today, as we stand on the crossroads of design and development, we are being told that in the West, austerity and its intrinsic need to recycle and reuse often translates itself into a depiction of a sense of poverty, that does not wash down well with the common man (Nigel Whiteley: guest lectures, July 1995, IDC). A similar thought today floods across the minds of the urban Indian middle-class that is constantly being fed on a diet of satellite television and a mindless and unreal show of affluence by the world's largest cinema industry, viz., our own Bollywood in Bombay.



In a closeup description of this transition from the village to the city, from our origins to the present I should like to mention how we moved out of our rooming-house accommodation to a cooperative-housing flatlet of 500-700 sq.ft. area with self-contained toilets and arranged linearly along a common passage. By then more members of the family had begun earning. The point to be noted here is that in this path towards upward mobility, we carried along with us some of our everyday aesthetic sensibilities with which we treated our living spaces. But we were also now required to adopt new ones. A wall here or a wall there (usually the one between the living and the kitchen area would be knocked off to give a sense of spaciousness to the house. And then suddenly, outside influences took over completely. The house now acquired western-style configuration of living space, with a sofa-cum-bed for the living area, a dining table and chairs for the kitchen area, a double bed and wall cupboards for

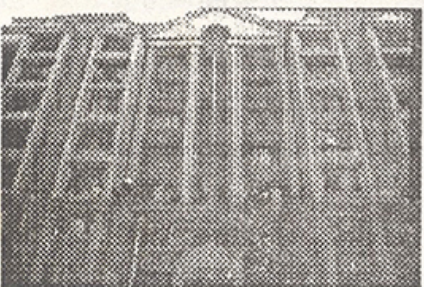
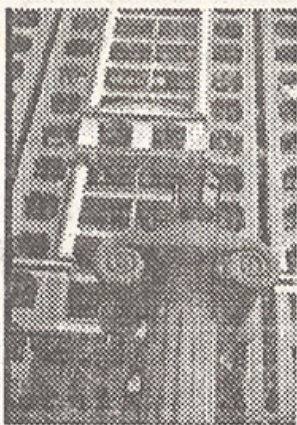
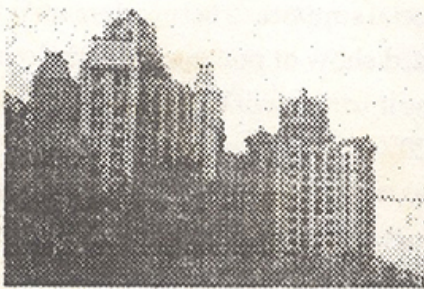




the bedroom. In place of the radio, so far placed in a glass cabinet (and possessing a pride of place perhaps only next to that of the gods and the ancestors), came the television, the refrigerator, kitchen gadgets. And all these not so much as a function of intrinsic need but as indicators of our place in society, a kind of infectious exhibitionism. Incandescent light bulbs replaced the fluorescent-bright lights. Pictures of gods and ancestors were now removed from the living room to be hung either in the bedroom or in the kitchen; and in their place arrived paintings or craft works, put up decoratively and quite removed from our real aesthetic reality or functions. After all, why ought one to have to exhibit in a fossilised fashion one's products of crafts if they were, indeed, so vibrant and alive in their existing functions? Needless to say that by now we had managed to kill and mummify our products of crafts that were earlier being used in our everyday lives, but were now substituted by Western-style gadgetry. Wall colours were now replaced by subtle, Western pastel shades and overall, the rooms had begun to get cramped with things since all these things, were imagined to be absolutely imperative for one's daily living and therefore, had to be acquired. While the breakup of the joint family into single nucleus families now afforded us more economically independent living, it also perforce took away the complexity of performance of the rites of festivals, since decreasing social support structure demanded such reductions. Instead, an outward show of pomp and splendour took over to replace the decline in the intrinsic working of rituals. The upshot of all this today is that, 20% of the country's population (approximately 250 million people) consisting of the urban middle class now strives to spend a disproportionately large amount of its income in having to acquire such expensive living spaces and further, to have to support a life-style that is still alien to one's traditional process of thinking; and which had innately consisted of values upholding the reuse of artefacts, the restricting of a wasteful use of available resources, encouraging a sense of non-acquisitiveness as well as a certain level of attendant austerity. Instead being able to live and think Western-style is today considered as being 'progressive'. The result of this transition from one mode of thinking to another is deeply reflected in urban middle class 'kitsch'. In the words of my student Sangeeta Hire who had worked on a project entitled 'Art and Society in the Indian Context', one might sourly conclude that "the well-to-do have always been most prone to go along with changing styles while others have followed only after a certain characteristic time-lag. (In this) Western interior design and fashion magazines have influenced them into imitating their home decor. The end result of all these being to create an environment that is very much alien to the behavioural, cultural and the mental attitudes of our society."

Having recounted in first person singular my views on where we stand today in our broad aesthetic make-up, I would now like to abstract a couple of points that are still axiomatic to our people's

sensibilities. And from which I expect to be able to tell you what trends of designing one might anticipate and by its logical extension, what trends of design education to be set up for our people. The most important thing to remember is the fact of our deep mental makeup towards what constitutes material well-being and to what extent are we willing to go along in order to embrace material consciousness. Are we prepared whole-heartedly to work towards a society where the manifest world predominates over the non-manifest one? And which, therefore, would require the integration into our present workstyle and pace, a certain sense of Western protestant work ethics in order to keep the machinery of consumeristic lifestyle well oiled. If one accepts to undertake a complete turn towards Western thinking and living, then what happens to our existing & soon to be forgotten reservoir of social mores, myths and rituals within which our thinking through the millennium have got encoded? Are we prepared to shed from our aesthetic sensibilities all these mythic images and adopt alien totems and beliefs? And if so, then are we prepared to work towards this change? And have we given a thought to the resources required for such expansive living, in a world already reeling under a severe resource crunch?



In reality, these questions do not beg for simple answers. And given our current reality, what we see is a complete mixture of Western and traditional values, so well depicted in an upper middle-class housing complex next door to where my design school stands. This housing complex, called the Hiranandani Gardens, reflects everything that is corrupt, dross and rootless. The buildings sport a style that is a distortion of post-Modern architecture, with a bit of Gothic, a bit of Palladian and a bit of everything thrown in to announce one's newly acquired wealth and splendour. The buildings have been poorly designed with little heed to basic functions such as a place for drying clothes; with the result that alongside a certain show of affluence, there is also one's laundry hung up for everybody's viewing. This distortion of our sense of modernity stands in complete contrast to the applause won a decade ago from architect Alvar Alto who was charmed by the functional and innovative use of space in the rooming houses of Bombay's inner city. Alto thought these chawls reflected man's ultimate sense of creativity in the efficient use of space and that these designs ought to be emulated for our spaceship designing. Somewhere even we ought to begin to tell our students that in a land where the living environment was once conceived of as a model of the cosmos, such 'kitsch' (as the Hiranandani) end up as complete blotches on our aesthetic credibility profiles and must be treated as being unpardonable.

Finally, I beg to place before you my overall contention that the human environment is not a dead variable but consists of things, persons, events. That these are not static, but interactive and dynamic

elements, with their usual share of conflicts and contradictions occurring between people and objects. For the designer to harbour the notion that he can improve the world by improving objects would go against the very health of a society's living; and in my considered opinion, badly designed objects could be solely responsible for the erosion of our human environment. Which brings us to an active consideration of what this environment consists of. And what, thereafter, should be the active supporting elements of an environmental design programme?

I once again quote from Maldonado's ideas of design pedagogy<sup>2</sup> - that "environmental design in future will have to concern itself not with dead variables but with live variables." We also have to bear in mind that while part of the world is poised for an absolute "cybernization of all processes of production, distribution, administration & communication", we in developing societies are still bound by an environment where the basic necessities of life have to be yet worked at. Under the circumstances, we have to keep our minds open to two sets of realities - one to the current turmoils of globalisation and to gear ourselves to take on these currents. The other reality remaining oblivious to these advancements. Our existing design programmes based on designing 'dead' variables (artefacts) need to be uplifted by a discussion of the behaviour, psychological & other elements of an active living environment where people matter more than things. The existing emphasis on developing routine skills needs to be placed in the broader perspective of an intellectual pedagogical structure. To my mind, environmental design will have to encompass all the parameters of the human environment, and which in turn, will provide the necessary structure & orientation to an environmental design programme. Environmental design must not be seen as one more specialisation to the existing gamut of design specializations such as textile design, furniture design, communication design & so on; on the contrary, all these ought to be grouped under the umbrella of environmental design. In this we ought to keep in mind two broad precepts :

1) that, without intending to dilute the specialisation of a subject, one ought to first induct in the student a core broad attitude towards design-learning, whereby design-knowledge gets rooted in a common base of Maldonado's physical & behavioural environmental design. None of our design schools have a course that roots itself so fundamentally in the initial lap of their design programmes;

2) secondly, the above proposition seems especially possible in today's day & age of interdisciplinary, interactive learning systems, with their attendant tools & devices. Drawing my cues from Maldonado's suggestion of the two sectors of the human environment (physical & behavioural), the topics to be dealt within the first sector would belong to the physical environment: the scale of city or urbane -

environment & the scale of equipment or product environment. The topics to be dealt with in the sector of behavioural environment design, on the other hand, would correspond mainly to the field of communications environment. And most of all, under the given setup, such a school of environmental design will be required to remain autonomous, but not autocratical, independent but not self-sufficient. I would wish to emphasize in the above classification the necessary inclusion of city planning & architecture (ie., in design schools that do not have these). And consider the corresponding sector- output to be one of Intimate Environment (interiors), Public Environment (city planning) and Communication Environment.

At the end, I would like to summarize all the above into one basic attitude towards design that has been aptly articulated by architect Gautam Bhatia while describing architect Laurie Baker<sup>3</sup>. This would be as follows: "the need to go back to origins to an understanding of a common and comprehensive way of living", so that at the end what one achieves through one's creations is a certain timelessness. Even though today we are consumed by a sense of immediacy, what is more likely to endure through time & ages are those collective experiences that are derived from our ground realities. If we are able to anticipate the cycles of change ahead and if the West is already discovering the aesthetics of an uncluttered non-wasteful living then perhaps we ought to prepare ourselves to remain at the front end of this emmerging cycle & may be even plan our future designs in order to make capital out of such strategic projection.

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# MAPPING THE GLOBALIZED MIND

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Uday Athavankar

Paper presented at the International Seminar

Design Odyssey 2010, 1994, IDC, Bombay

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## Abstracts

Global products are as much a result of the technology push approach to product development as are factors like economies of scale of production. The pace at which these culture-free products are being conceived and are crossing national boundaries is staggering. There is lurking fear in the minds of thinkers, particularly from the traditional societies, that western objects, thoughts and behavior patterns will invade their countries and destroy the local cultures. The future scenario that they paint, exhibits a world as a monotonous monolith, mostly dominated by the cultural notions of the advanced countries.

The first part of this paper deals with the concerns of the traditional societies and their feeling that the influence created by the entry of alien objects would disturb the prevalent perceptions and notions of people about their local objects, thus destroying their cultural identity. Will this invasion destroy the existing mental notions about the objects, that these cultures have passed on to the new generations.

By focussing on the mental world, the paper treats the relationships between objects and culture as a mental event and explores questions like; how will people deal with the new objects crowding their

mental space? In responding to these changes, will they restructure their mental space in future? Developing this line of thinking further, it explores the idea of the monoculture invading the mental space of individuals in the traditional societies. Starting with a quick review of how people mentally map the object categories to deal with the complexities created by enormous variety in the real world objects, the first part of the paper goes on to show how "notions" about objects and the mental maps of object categories may be totally transformed in the future.

In the second part, attention is shifted to the process of globalization and the real world scenarios that are likely to emerge. The paper argues that treating the globalized or regionalized world as a binary option is too limiting. Similarly, a picture restricting the scenario to a mixture of objects from local and foreign sources would be far from complete. Exploring the kind of mental maps these scenarios suggest, the paper pleads that globalized and regionalized world scenarios should be treated as two ends of a continuum to explore the space in-between.

In exploring this in-between space the third part, the paper relies on examples

from history where global influences have meshed with local cultures to evolve a new identity. Attempt is made to show how the regional identities would still emerge and would largely depend on the way societies understand and control the process of assimilation of objects through design. The concept of assimilation is explored further through contemporary examples that will show how in art, particularly in performing arts, and architecture this process is already active.

Looking at history, it appears that in spite of all the euphoria, global products can not be an all pervasive alternative. Its validity is restricted to only specific object categories. In many other object categories, assimilation is an inevitable and a desirable option. Attempt is made to classify products and develop a design strategy that is sensitive to different object categories. The paper explores the potential influence of such a thinking on design education.

Keywords,  
Globalization, Categorization, Product Semantics, Objects and Culture, Assimilation

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## Part 1

### Human Categorization :

#### a Basis for Understanding of Object and Culture relationship

Globalization has its roots in economics of production, need for access to new markets and need to sustain growth. Globalization and open markets touch broader socioeconomic and political issues, but the question of interest to the design community is that role the global objects may play in influencing culture. What price would traditional cultures pay for globalization? In our obsession to improve our standards and lifestyle, are we also bringing in western values, along with the new products? Will this onslaught wipe out the traditions

that these societies have been nurturing for several generations? Is a 'cultural invasion' round the corner?

This paper looks at this issue from a slightly different and limited standpoint. The theoretical framework used is based on the way humans mentally deal with objects they encounter in the real world, how they access their meanings and decide on the response - a process often referred as categorization. Brief review on the relevant parts of the work on categorization, is included in this paper can be built on this base. Limited space available does not permit extensive discussions on the categorization process.

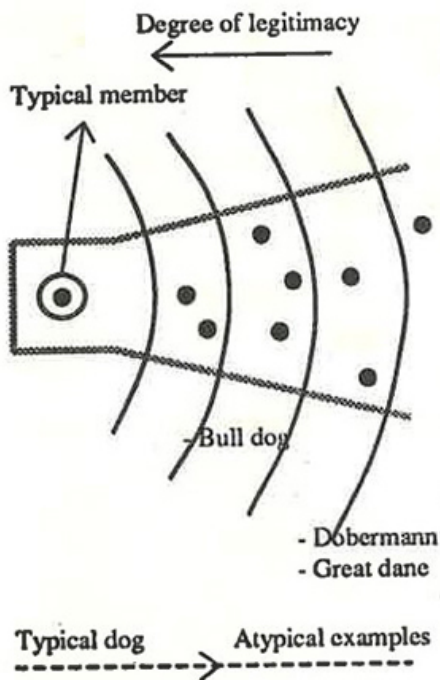
### Overview of the Categorization Process

Categories were initially viewed by Aristotle as containers with a rigid boundaries defined by the features shared by the all the members of the category. If the object contained shared features, it was admitted as a legitimate member of the category. The ability to classify objects into limited categories and label these categories with lexical terms has always been recognized as a unique human trait. This was a generally accepted view on categorization till Wittgenstein<sup>1</sup> as well as Rosch<sup>2,3</sup> pointed out that the Aristotelian notions of human categories were unable to explain the way humans deal with complexities of the real world. Some of the unique features of the process that they pointed out are briefly discussed here.

Categories are not tight containers, but have fuzzy boundaries, allowing us to add new examples as legitimate members. When we encounter an unusual and yet unseen example, we tend to shift the boundary to make the category more inclusive.

Categories are structured in a unique way. One of the members of the category, often the most typical example which reflects the essence of the category, is treated as a central member to metonymically represent the category. All other examples are then mapped by treating the central member as a 'cognitive reference', and based on the degree of similarity are given a graded membership within the category. The graded internal structure of mental categories is a result of the process of comparison with the central member. A mental map of the category then shows a central member, with objects different from the central member located away from it. Examples differing radically from the central member are positioned further away near the fuzzy boundary.

In spite of our limited mental capacities, we are able to deal with this enormous variety because of our abilities to develop categories and structure them. Though we are surrounded by innumerable objects that we see, we are able to understand their relationships, use, talk about and remember them without these becoming a cognitive load.



**Figure 1 :** Members within the category are given a graded membership, using typical member as a cognitive reference. Typical member is perceived as a 'proper' example to represent the category.

What matters to us for the current discussion is the characterization of the central member. Take for instance a category dog. Which dog will you select to explain to your child what a dog is like? Surely not a Doberman or a Great Dane or a Bulldog? All of us invariably treat the most typical dog as a central member to explain the idea of dog. The Central member is used for understanding the category as well as for deciding our response. The features and characteristics of the other dog breeds are then compared with this reference, and they are located at a distance proportionate to the degree of similarity they have with the central member. The mental map of the category 'dog' would thus show a gradience. Refer figure 1.

New categories with their own central member are formed when we encounter objects substantially different from the existing objects. Thus we have a categories called a satellite, a music system or a jogging dress, categories that would not have existed few decades ago. How is the process of categorization relevant to the current topic?

### Culture and the Notions of 'Proper' Example

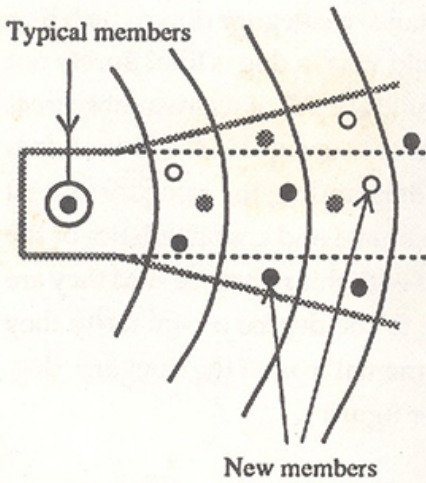
The central member plays a key role in how we deal with the real world. It is treated as a 'proper' or a representative example of that category and is used effectively to understand the category and develop our responses. What makes the strategy relevant to us here is that, within a culture or a subculture, there is some kind of understanding and acceptance of the central member.<sup>4</sup> Thus a 'proper' example of a 'dog' in India and say Europe or China can differ widely and they often do in reality.

The concept of 'proper' is not restricted to the processing of the natural objects but is also extended to the world of manmade objects. Thus we have notions of 'proper' coffee cup or a 'proper' dress to wear for a wedding or an informal evening party. Our notions of 'proper' example also govern other human responses. Thus we have notions of 'proper' pronunciations of words, 'proper' gestures for specific events and even 'proper' behavior.

There are several formal and informal mechanisms that ensure continuity of these notions. The notions of 'proper' are informally passed on to the next generation during the process of growing up, through what parents and community tell children and through interactions during social events. More formal mechanisms of ensuring this continuity which either consciously or by default define these notions, include educational system and books. However in the current context, the strongest single influencing factor is media and more particularly advertising, which often directly suggests what the notions of 'proper' example should be.

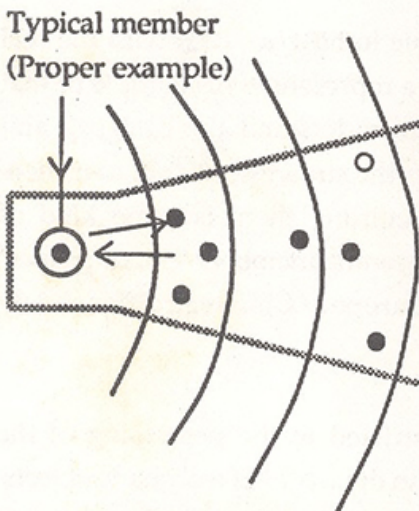
### Transformation of the Cultural Notions

In categories dealing with manmade objects, the variety can be willfully created. How do we respond to the variety within the category? First we make the category more inclusive by shifting the boundary, so that the potential members that we consider legitimate are admitted. This may not only require flexing our ideas of characteristic features associated with the category, but also the definition of our notions of 'proper' example. Refer figure 2.



**Figure 2 :** Categories become more inclusive when the variety within the members increases. The fuzzy boundaries are shifted to accommodate new members.

The fact that notions of 'proper' are susceptible to pressure is worth noting. These notions thus change with time. Take for instance our notions of 'proper' shoes or 'proper' wrist watches in urbanite Indians. They have undergone substantial transformations in the last two decades. In fact the entire mental maps have been transformed. When the central member, which acts as a reference point for comparison itself changes, the graded membership of the other examples within the category are also transformed. Refer figure 3.



**Figure 3 :** Our notions of 'proper' example representing the category are not static and evolve under the influence of the surrounding members from the category.

Interestingly, cultures do not appear to treat all object categories as equal. The mental maps of some object categories flex their boundaries more quickly to accommodate new members. Others remain somewhat rigid in admitting new members, often due to cultural pressures. For instance, western notions of a 'proper' car are continuously being transformed, partly aided by advertising messages. Similarly, notions of 'proper' office furniture have changed faster than our ideas of domestic furniture. Our notions of a 'proper' dress for an evening party have seen more transformations than dresses for office use.

Not all categories flex with ease. Object categories like bridal dresses have resisted pressure to depart substantially. Often objects connected with rituals are more tradition bound, where cultural pressures contribute in maintaining the continuity. The notions of 'proper' or representative examples are culture specific and have an important role in our understanding of the cultural notions. In fact, they are central to the study of relationship between objects and cultures.

The fact that notions of 'proper' are susceptible to pressure is worth noting. It is also likely that in the process of developing new objects, we ourselves as designers are contributing to creating the pressure for transformation of these notions. Discussions on mental maps, transformations and their relationship with the design approach are documented elsewhere.<sup>5,6</sup> What is relevant to the present discussion is that cultural notions are in a way a threat to the idea of globalization and the commercial process which drives it. Particularly in the last few decades, the need for access to global markets has dominated corporate policies. What are its implications on the prevalent cultural notions of the object categories?

## After the Sixties: Cultures Coping with Variety

The past three decades have seen number of radical changes in the business and the technology environment. Technology was seen as a means of getting a competitive edge in business. Markets were flooded with new high quality and low priced products, with consumers getting extensive options to select from. Products themselves changed their complexion radically, partly because of the major role played by electronics and computers in releasing the constraints on the appearance of the new products. With rapid technological developments, we seem to have over utilized this freedom to make willful changes in manmade products. How does it affect the way we deal with the object categories?

We will restrict our discussions only to two features of these decades that are relevant to us here, namely the enormous variety in new objects within a category and the short life-cycle of these objects.



### Crowding of the Mental Maps

In manmade objects, the variety is often willfully increased for business opportunities, the only control being market mechanism. The corporate world has recognized new product development as a means of survival and growth. So advanced countries have witnessed introduction of new products at a very rapid pace during the last 3 decades. Take for instance products like cars, cameras, personal computers, video games and others. Number of these new objects had no precedence in the culture in which they originated. No wonder Toffler's 'Future Shock' became such a best seller in the West!

### Short Life-cycle of Objects

The life cycles of newly introduced objects are getting increasingly shorter. Rapid introduction of short life-cycle objects with widely differing specifications is a problem faced by societies in most of the advance countries. For instance software industry has seen development of activities on a scale that are difficult to keep a tab on. The hardware industry is not too far behind.

So the problem is really acute, first because of the rapid pace at which new objects are introduced in the markets and second, because these products are short life-cycle objects. The category boundaries are continuously flexed, new categories or subordinate categories are formed. With the result, the notions of 'proper' representative examples in the category are under continuous pressures and pulls.

Short life-cycle of objects raise another issue. In a world where objects are created and thrown at a rapid pace, is the concept of mental maps just a neat idea? How do humans respond to this unprecedented variety?

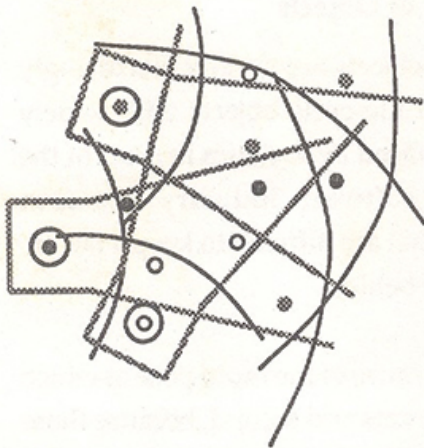
Humans seem to use some of the following options. First, we shift the boundaries to include these variations as we have done in case of objects like writing pens and shoes. Second, we open up a new subordinate category within an existing category as we have done in case of objects like sports cars or electronic diaries. Third, when objects differ sufficiently, we tend to start an altogether new object category, as we have done for personal computers. This may involve making sub-categories which are related to each other and still reflect the graded membership. George Lakoff's idea of radial structure of the categories suggests the most plausible explanation of how we deal with this enormous variety.<sup>7</sup>

The changes in the mental map don't just stop here. We also have to continuously redefine the notions of 'proper' example and restructure the category to make sense out of the variety. Cultural notions remain all the time under pressure to change.

The problem does not appear to be how we restructure categories, but the strategies we use to deal with the dynamic changes. We have a case for a dynamic maps, where the notions of 'proper' are being continuously redefined. Is transience the key feature of the category maps dealing with manmade objects? How do we actually handle such a situation?

#### Manifestation of Subculture Identities

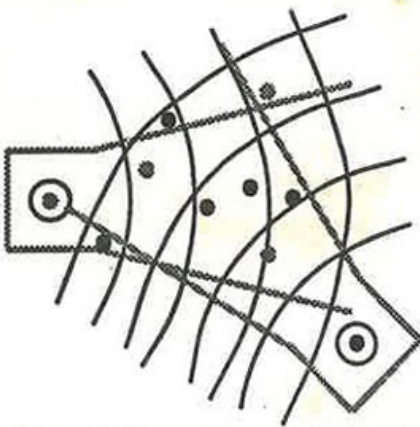
Merely shifting the boundary to make the category more inclusive does not mean all the members within the category are attended to. Options beyond a point force people not to attend to some of the examples that are not of immediate concern to them. But variety gives opportunities to the subcultures to express their identities. Refer figure 4. The social groups can narrow their view of the category selectively, by choosing certain group of the objects from the wide options available within the category.<sup>8</sup> Once the choices are made by the group, it follows that the notions of 'proper' example would differ between sub-cultures and so will their mental maps of categories. Sometimes the notions of 'proper' can differ very widely. For instance, in the sixties, the 'hippies' and the 'establishment' had little to share in their notions of a 'proper' lifestyle.



*Figure 4 : Variety permits sub-cultures to create their own identity by narrowing down their choice while neglecting the other members. With the result, the notion of 'proper' member may change from one sub-culture to another.*

What are the implications of these changes? With proliferation of subculture identities, the chances of a culture sharing common notions of 'proper' example are low. It is becoming rare to find a common central member representing the entire category, shared by a culture.<sup>9</sup>

With such intense commercial efforts in promoting variety, notions of the 'proper' are also unlikely to be shared by the two consecutive generations. The generations now markedly differ in the way the



**Figure 5: Generation gap.** Category members which are on the fuzzy boundary for one generation are perceived as 'proper' examples by next generation.



category is mapped. The differences can be so large between two generations that, what the young generation considers as a 'proper' example to represent the category, the previous generation treats as an example on the fuzzy boundary. Refer figure 5. With continuous pumping of variety in manmade objects, one could see enough of visible differences between two generations to coin the term 'generation gap' in the sixties and seventies. The generation gap is in fact a reversal of the category map, with the new generation viewing the category from the fuzzy boundary.

The problems of accelerated growth have now crossed even this stage, with each generation experiencing several changes in its span. This is what has happened in areas that thrive on innovation like popular music. Now we often associate objects with decades and refer to them as objects of the seventies or even late eighties or early nineties.<sup>10</sup>

### Transience of Notions

Short life-cycle of objects allows little time to identify a central member and develop notions of 'proper'. Perhaps societies have to accept, that as far as manmade objects are concerned, the notions of proper will be transient and continuously evolving. This explains the important role that the advertising has assumed in modern societies. We are now tuned to the notions of 'proper' being artificially projected.

## PART 2

### Globalization and Traditional Cultures

Traditional cultures are going through the process of liberalization of their economies and opening up of the markets. National boundaries have limited meaning in the new trade scenario of these countries. Its overall implications are beyond the scope of this paper, except to the extent of exploring its influence on the relationship between objects and culture through mental maps. That is what we shall restrict ourselves to.

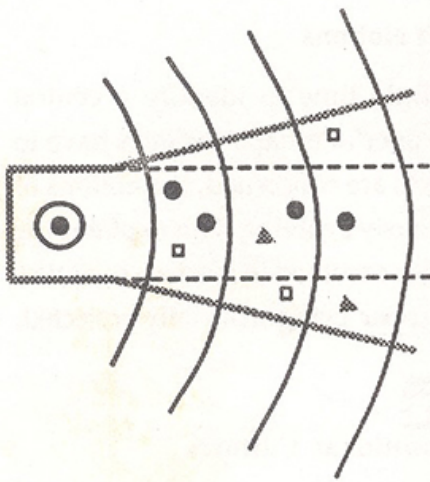
When countries with unequal economic strengths are involved, liberalization works like a subtle form of colonization. It gives semblance of nations retaining their sovereignty. Yet smaller countries are invaded with objects and services through open trade. So the problems that the rapid introduction of widely differing short life-cycle objects posed in the advanced countries, is now faced by most other cultures. However there is one major difference.

When a new object is developed within a culture, even if it has no substantial precedence, it has the advantage of growing and maturing over time. However, with liberalization of markets in cultures

otherwise bound by traditions, matured objects are suddenly introduced with its fully variety. This is what traditional cultures are facing now. The rate at which the new objects are entering the mental maps are so high, that its no wonder that the phrase 'cultural invasion' is often used to describe this phenomenon. What would such a phrase mean in context of our discussions?

### Entering the Mental Maps

At a gross level, it has effects similar to the introduction of variety in a category. The mental maps have to become more inclusive by shifting their boundaries. The difference is that the new products on the boundary would include objects transplanted from other cultures. Initially these objects would be seen as alternatives to the local equivalents. This is not an unusual scenario in todays context. In most developing nations, we see foreign films co-existing with local films and continental food offered as an option to local variety. Perhaps the perceptions would be similar to how Kashmiri carpets are viewed in United States or Indian restaurants are seen in Europe. By admitting in the map, the new examples are recognized as one of the alternatives, sometimes as an exotic variation, to be experienced once-in-a-while. Mental map of the category at this stage is almost like a multi-channel television or a supermarket, where widely differing alternatives co-exist. Refer figure 6. Thus in India, you have soap operas like 'Bold and Beautiful' co-existing with the Mexican serial 'No One but You' and the vernacular 'Junoon'; and western hard-rock thriving simultaneously with traditional melodic local popular classics. The new generation can enjoy both without difficulty. They are comfortable with pluralism of the cultural expressions. It is not a bad scenario up to this point, nor can we use the phrase 'cultural invasion' to refer to this phenomenon. It would not be right to call entry of foreign objects as invasion of culture, at least till it substantially alters or substitutes the notions of 'proper' in that object category.



*Figure 6 : When the objects within the category differ and yet co-exist, the category maps would look like supermarkets. Besides, notions of a 'proper' example representing the category are defused.*

What starts as an option, starts gradually influencing the existing accepted notions. The first change that occurs is the formation of subcultures, largely alienated from the local culture. Such groups identify more with their counterparts globally. It can not but have ripples passing through other groups within that culture. The process of diffusion is triggered, however slow it may be. It is important to ponder on what happens beyond this point.

### Invasion of Notions

As these foreign objects get accepted and are well diffused, they start gradually moving closer to the central member on the mental map. They are now in a position to potentially influence the notions of 'proper' in that category and eventually replace it. For countries which have gone through the extended period of colonization, this is

not an uncommon phenomena. For instance, in India, in spite of climatic factors being unfavorable, trousers have replaced dhoti as a 'proper' example of daily wear. The table and chair have become an inseparable part of urban lifestyle and eventually the ripples would spread all over. There is no shortage of examples of such substitutions.



On the face of it, the influence was selective to specific object categories and behavior and also largely restricted to urban areas. But it is just a matter of time before these percolate further into the culture. In the colonies, the diffusion process has left deeper impressions and has substantially altered notions even at vernacular levels. For instance, in a vernacular illustration of in alphabet charts for children, the picture accompanying the word queen, often looks very British. It is not unusual to find the bridegrooms even outside urban areas to go out of the way and make a two piece suit that they can't afford, often to be used only once.

Do existing regional traditions stand any chance of survival? The argument so far, seems to support the idea that liberalization will ultimately remove the regional diversities and lead towards a monoculture. How realistic are the two potential scenarios; a regionalized or a globalized world? Let us discuss each of these possibilities briefly.

Let us start with the question; can we retain the regional traditions and identities? Will traditional societies exercise their options to select what they want and prefer? In other words, will the traditional cultures stand this invasion?

#### Resilience of Cultures?

Those in favor of this argument suggest that cultures, like biological systems, have sufficient integrity to resist foreign intrusions. But the modern corporations trying to enter new territories with their global objects use precisely the same approach that the faculty of medicine uses to handle biological systems. Take for instance heart transplant. The entire body resistance is immunized through medication, so that it can accept the donor's heart.



Global and multinational companies use the same strategy, 'but immunize in a more subtler form. They never transplant the 'objects' in isolation, but include them in a total package. In fact it is the 'need' that is transplanted first by carefully orchestrated advertising. So you are 'mentally ready to accept the new object as a natural (?) choice. Besides, these companies package aggressively low prices with heavy promotion to overcome cultural preferences. No wonder media is such a potent weapon in the modern world. It attacks the mind directly and without pretense.

It is often argued that objects are designed with specific physical context in mind and assume certain user background. Since an identical context is unlikely to be available in another culture, the objects will anyway fail. A careful look at the current scenario tells a different story. The 'objects' are often transplanted along with the environment. You have to often replicate low temperatures and create dust free clean-rooms to artificially support the objects. The package typically has to include operator training to even-out the differences in the user backgrounds.

#### Organized Resistance

The other option often advocated is to create resistance through public opinion and awareness. This has occasionally shown some success. Societies have resisted 'MacDonaldization' of their neighborhoods through public protests. Television channels have been forced to accept changes through cultural pressures. But public opinion is a fragile commodity and can change very quickly.

In spite of these problems, awareness is one of the viable options open to traditional cultures. But it can be used only selectively, where people are willing to rally round to identify with the 'cause'. To preserve the regional identities by resistance is not an easy task. In urban India, we seem to have become more westernized after independence and this is so by choice.

#### Culture Free Objects

Totally regionalized scenario also does not seem logical because of the new approach to product development. Large number of contemporary innovations in objects are technology driven and are conceived to explore the potentials of new technologies. They are often termed as 'innovations in search of needs'. Even if you leave aside the exaggerations, it must be conceded that these objects do not come about by 'watching people' and monitoring 'cultural and social trends'. So the traditional relationships between lifestyles, needs and objects are unlikely to have visible influence on the development of new objects. In their conception and sources, they tend to be relatively culture free global ideas trying to fulfill needs that are yet latent.

Technology seems to have neutralized any advantage that regions could boast of. The tropical fruits, bio-engineered to grow in a laboratory environment anywhere in the world is not a very distant scenario. Besides, information technologies have been transcending the boundaries very easily, the point that needs little elaboration. With information freely flowing across borders, to retain regional traditions is becoming increasingly difficult. Technology is a powerful force that is driving the world towards a converging commonality.

A future scenario where regional differences remain conspicuous does not seem practical anymore. But will the opposite happen?

### **Towards Monoculture**

Let us briefly investigate the possibility of a monoculture scenario invading the world. In our framework, for the globalized world and monoculture to become a reality, it must meet the condition that the spatial disposition of examples of objects on the mental maps, as well as the notions of 'proper' are shared for any given category. In other words, the mental maps have to be truly identical across the globe. This does not seem possible on several counts.

As we have seen earlier, once there is a large variety, it offers opportunities for the subcultures to manifest their identities by choosing from the variety available. It would permit regions or cultures to differentiate themselves by exercising their choices from the wide options available. It is also argued that, even when the objects cross the boundaries, there is always a catching-up time.

There are other arguments which also negate the possibility of a monoculture scenario. For instance, there will be some requirements which will always remain regional and the objects that cater to these needs will have only local relevance. So, besides the maps being dissimilar, the differences in the objects will not get eliminated, but at best may only reduce.

### **Future Scenario**

It appears that our response to different categories of objects is going to be widely different and the future scenario is going to be some kind of a mixture. Some object categories may remain global. Their basis is in standardization, so that they can be shared, transported across the globe and understood immediately. Such standardization was initially visible in computer languages, communication codes (in international air or ship traffic control) and to a limited extent in airport signages, but is gradually encompassing high-tech objects. There are also other products that are accepted because they are global in nature. For instance Coca-cola is bought and consumed because people want to share a globally common experience. Any major tampering with its characters is likely to be counterproductive.

But there are a lot of other object categories where there is strong local traditions. In dresses, furniture, house forms and cooking implements, most cultures have a strong and fairly developed notions of 'proper' examples. To neglect these perceptions is not fair nor desirable. (Haven't we learnt our lessons from the efforts to consciously preserve bio-diversity?) Continuity with the roots is important in these object categories. Assimilating with existing stereotypes makes sense when

the society has already developed cultural notions in these object categories. Such a design approach will allow the notions of 'proper' to transform into something new, yet maintaining its continuity with the past.

It was mentioned before that the mind does not treat all categories as equal. Some are susceptible to cultural pressure more than others. It is very clear that different object categories will respond differently to the global influences. These decisions are cultural and it is not easy to identify the basis of these decisions. Perhaps each subculture may respond differently. It is clear that the mental maps will not be identical to all categories of objects and would depend on how culture sensitive the specific object category is. It appears that for most objects, the reality lies between these two possibilities. Would it be prudent to treat the regionalized and globalized worlds as two extremes of a continuum and explore the options available in-between?

The future obviously lies in how well we, as individuals as well as professionals, can successfully integrate with global trends and also retain sensitivity to regional issues. Flexibility will remain the key. Future designers will have to be comfortable with working on three kinds of products. First, the global products which remain consistent universally. Second, work on local products which reflect the needs and aspirations of the culture and third, products based on fusion of foreign ideas assimilated in varying degrees with local cultural notions. There is a need for designers as well as design educators to reflect this plurality in their approach. This is inevitable in the future scenario, but are we ready?

Meanwhile there is something in this for the exponents of global products. They will have to balance between making economic as well as cultural sense. Not yielding to cultural pressures can keep them on the fuzzy boundary, particularly in categories that are culture specific. If the objects have to be integrated with the culture, the routes that have to be followed are different.

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### Part 3

#### Design Response

It you look at history, the current situation can not be called unusual. But because of the commercial pressures, it has only assumed unusual dimensions and a sense of urgency. Attempt to spread the ideas and influences beyond the national and cultural boundaries has several precedences in history. What is new is the pace and extent of the phenomenon. We can briefly look at history where similar events have occurred earlier.

### Lessons from the History

We should look at how ideas and objects crossed the national boundaries in the past. History shows that the ideas had to be transformed so that they can be assimilated in local cultures, particularly when what it attempts to influence is culturally close to the hearts of people. We can understand the events better through examples.



Religions have always crossed national boundaries to spread their message across the globe. Is there a lesson that we can learn from these accumulated experiences? It is interesting to see how Christianity spread in India during the first century. Christianity came via the Syrian route and early settlers were in the southern part of India, now called Kerala. The community is often referred as Siro-Malabar Christians. Their churches, rituals, dresses and even names show how well they have assimilated Christian practices and yet retained their roots in the local culture by showing flexibility. Their wedding ceremony shows an interesting mixture of local customs and Christian practices. For instance the bridal wedding dress is often a off-white Indian silk sari with extensive golden jewelry. Understandably the western wedding gown tradition in Christian weddings is a later development in history. But even when it came to India during the Colonial time, Siro-Malabar Christians showed their capabilities of selective adaptations. So more recent weddings use a bridal crown and a veil adopted from the Latin Christian practices but the sari continues. Their ceremonies include lighting of the traditional oil lamps common in Hindu customs. This is no way an isolated example. History is full of instances where religions have adopted the local customs, languages, iconography and even accommodated local food practices by showing flexibility.

Assimilation, left to occur though an unselfconscious process would happen gradually and in levels. Take for instance languages, which do not develop through conscious efforts. They evolve naturally in usage and interactions. For instance 'Urdu' as a language developed on Indian soil when courtiers, who spoke Persian or Turkish, interacted with the masses. They used variations of local languages and Urdu was born. Urdu is a synthesis of many indigenous languages - Sanskrit, Hindi, Braj Bhasha, Khari Boli and Marathi, but it also shows lexical influences and grammatical features of Persian and Arabic. Interestingly this has not prevented it from acquiring its own exclusive identity.

Examples that deal directly with manmade objects come from the later part of history, where assimilation as a strategy was deliberately used. Early British architecture in the colonies was driven by the need to leave a distinct mark of their presence in India. This was consistent with the expressed British intentions of imposing British standards in

all areas of life. But the later architectural works as well as the debates show British architects caught between imposing their national style and presenting an image that was more amenable to Indians. Architects subscribing to the later view have drawn on broad range of sources from Europe as well as local architectural tradition.<sup>11</sup> This trend later matured into what was labeled as 'Indo-Saracenic' architecture and now remains as a part of the distinct heritage in the country. (1) From the Islamic period, architecture of Fatehpur Sikri in India, the city built by Akbar, is an excellent example of conscious fusion. Can we adopt such a design strategy?

### Responding Through Design

We can not forget that modern design is an artificial process, carried out in studios. The process is often time bound and the place of its evolution (or rather synthesis?) is usually alienated from the influence of society. Extensive time is not available for the assimilated ideas to evolve on their own. And if you go by the present trends, future products are also likely to be developed by trans-national teams. How can designers become sensitive to cultural issues?

To add further to the difficulties, life-cycle of the objects and design time allotted to create them are reducing rapidly. New objects do not any more evolve slowly from within a culture any more, nor do they stay long enough to mature and so get automatically identified with it. Assimilation is perhaps one of the answers. Trans-national teams working on development of objects in another culture can definitely look at assimilation as a design strategy.

If we are keen on learning from history, the writings are clearly on the wall. We must to take a long-term view. We have no options but to build data bases and tools, network with local designers who have internalized the traditions and evolve design strategies to make object making culture specific, at-least for object categories that are culturally sensitive. Difficult but not an impossible task.

It is not possible to wish away the globalization process, without loosing some of the advantages that it promises. One of the viable route is to use assimilation as a design strategy. Yet the process of assimilation is not fully understood nor characterized to make it a predictable design strategy. At this point we can only pool together what we know about the assimilation process, and make some observations. We can only look forward to a greater clarity and insight in the future. It appears that cultures seem to assimilate things in two ways. The first approach is based on accepting plurality of the statement by choosing and juxtaposing the objects without radically altering them. The second approach encourages fusion of the objects from two cultures.

## Assimilation Leading to Pluralism



A more common way of adopting to the new circumstances is to use objects and features from the two sources for two different occasions separated in time. This assimilation is akin to the efforts of the first generation immigrant, who want to retain and express their dual roots. Thus one would show western traits in his dress and behavior in the office and return to his regional traits after returning home. The plural identities of the first generation immigrants emerge from how effectively they are able to combine and balance the two. Another variation of this approach includes juxtaposing of the objects from two different cultures, without the objects themselves getting transformed. A common example of this approach would be the men's wear in India, where people combine traditional Indian zabba with trousers or a sleeveless Indian jacket with a shirt. New generations can enjoy both without difficulty. They are comfortable with pluralism of expression. This is also apparent in the food habits, where breakfast shows influence of western norms, but the meals contain markedly local recipes. The plurality in the identity emerges from the way the objects are juxtaposed in time and space. This is the most pragmatic and easily adopted approach, but it does not demand change in the design of the objects. Urban areas in most of the earlier colonies are full of examples of such pluralism.

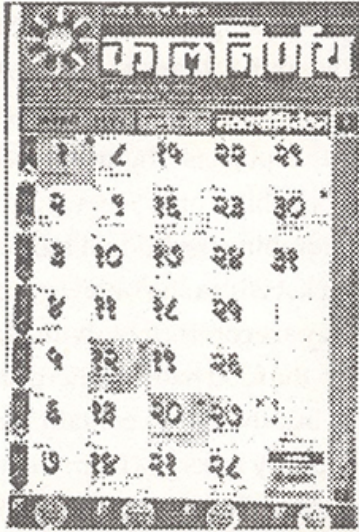
### Fusion of Two Trends

The second approach to assimilation depends on elements of the objects of two cultures getting fused together. This is a more exciting possibility from the designer's point of view, since it demands evolving a coherent statement from two diverse inputs. Unlike in the previous approach, the initiative is with the designer. Can this kind of assimilation be used as a design strategy?

In objects, the initial assimilation levels often involve minimal functional changes (like tropicalizing of components etc.). In reality, Theodore Levitt's<sup>12</sup> concept of multi-nationalism does not appear to have crossed this level in development of products. These objects are similar to foreign films which are either sub-titled or dubbed in a local language. This is only a superficial level of assimilation, a mere lip sympathy. But this is what most of the corporations have been thinking as an adequate response to local issues. It is perhaps a commercial manifestation of 'think global, act local' strategy.

Real Assimilation is in fact deeper, where concepts, ideas and features fuse together to evolve a coherent statement. Because assimilation involves combining two relatively strange objects, it demands flexibility from either side. It also demands tolerance, because some of the initial efforts often look strange. For instance, the initial efforts by British architects in assimilating Indian architectural features in Muir College building in Allahabad by William Emerson and in

senate house at Madras by Chisholm do make discerning viewers raise their eyebrows.<sup>11</sup> When the assimilation process develops over a long period the efforts look very natural. In modern design process the task is not so simple. Yet, we have no option but to understand and decode the assimilation process and see if it can be predictably replicated.



It is easier to understand the process through examples. Take for instance the popular Indian vernacular calendar 'Kalnirnay'. The months and dates are structured around an English calendar. But it also incorporates detailed information of the traditional moon based Indian calendar system. It also gives important moon positions connected with Hindu rituals, festivals and excerpts from traditional panchang. (2) Interestingly, respecting the local multi-religion tradition, it includes information on festivals of other religions as well. It has truly assimilated various streams and has yet managed to make a coherent statement and retain its exclusive identity as a local calendar.

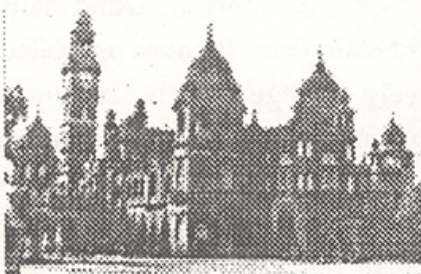


There are several examples in fashion design in India where designers have borrowed ideas of cuts and body-fit from western fashions and fused them with local notions about dresses, colors, patterns and dress materials. It not only ensures acceptance but allows the notions of 'proper' to evolve with time. Examples cited earlier of Islamic and British architecture also fall into this category. Whenever object stereotypes have existed in cultures, assimilation has given them a new life.

### Assimilation and Regional Identities

There are some questions that we must confront. How is assimilation connected to regional identity? Would the objects loose their identities in fusion?

It was mentioned earlier that the notions of 'proper' are continuously getting transformed. The assimilation with local traditions only ensures that the new objects show far greater continuity with local cultures than totally alien objects. By using features and visual language of the local regions, the objects are likely to appear less alienated from the cultures and at times beautifully merge with it.



Assimilation of ideas from across the regions with local traditions does not necessarily mean loss of identity, but in fact helps in reinforcing cultural distinctiveness. British architects used this strategy effectively when they were commissioned by the princely states. They intergrated in their buildings, forms which were specific to the region, preserving the local particularities and traditions. The approach also helped Maharajas to define and express their split identity. It

allowed them to align themselves with British cultural values without fully abandoning their own.<sup>11</sup>

Interestingly these buildings also show their links with British architecture. The links with its origin are not lost. No body can deny that British architecture, even when it attempted assimilation in different colonies, still looks quite British. So does Islamic architecture, which has retained its exclusive identity. Other examples would be food recipes, where it is not uncommon to see such fusion. Chinese food changes its taste to suit the local demands, but somehow it has never lost its identity, the Chineseness of the Chinese food. There are lessons that one can learn from Jazz music, which has successfully assimilated regional musical influences and still retains its identity. Performing arts have shown how they have borrowed features from other cultures, as well as other local art forms to enrich their own vocabulary and yet retain their identity and regional roots. (3)

Flexibility is key to assimilation, but it is more difficult to achieve when the principles that govern the design of the objects do not permit this flexibility. Puritanical and minimalist values of modern movement in design had restricted play of expressions severely. Fortunately, the trends in the last two decades have loosened this grip and created the necessary flexibility.

As a process, assimilation has wider applications, even for objects developed within the culture. It can suggest how the local objects can be transformed to look contemporary and yet retain the roots in the culture. A detailed discussion of this topic is outside the purview of this paper. It is sufficient to note that when the design initiative is from the local culture, new object is likely to be based on transformation of an existing central member of the category, thus automatically ensuring the continuity. It is difficult to treat these two situations on par, because the objectives as well as the strategies of assimilation are unlikely to be same. In this paper, the discussion is restricted to the assimilation of objects from outside the culture.

#### **Limitations of the Approach**

Assimilation also has some limitations and can not be used as an universal strategy for all objects. At best it can be selectively used to deal with specific object categories. Comments on this aspect would be relevant here to avoid its indiscriminate use.

Some objects are bought mainly because they are global. They are perceived as symbols of modernity, sophistication and identity, particularly in elite subcultures in urban areas. Products like Kashmiri carpets, Chivas Regal and Channel perfume or even some professional equipments like high-end cameras and instruments are bought as

speciality objects, identified with a specific company, a region or a country. These objects acquire this status because they have retained their roots. They will lose their value if they are experimented with. Assimilation does not make sense with these type of products but with others.

There are other difficulties that one has to encounter. For a number of new technology driven object categories, there are no equivalent object categories in local cultures. So matured notions of 'proper' examples in that category would be absent in that culture. Take for instance categories like medical instrument. ( Electron microscope, C. T. Scan, Angiography equipment etc. ) or products like paging systems, fax machines etc. These categories pose a difficult, if not unsurmountable challenge to designers. Nor is this a good excuse for neglecting the local notions of 'proper' in object categories, when they exist. But the design challenge is in confronting these difficult problems. When applied to products, assimilation as a strategy poses another problem. Unlike buildings which are site specific and create a setting of its own, the objects can occur in varied environments. Buildings are rooted in the region, the fashion clothings are rooted in the personality of the individuals who are wearing them. However products have floating roots and may have to sit next to strange neighbors. This makes the task more difficult.

#### Assimilation Process: a Black Box

We know so little about the assimilation process. When is assimilation justified and relevant? How do we distinguish a good example of assimilation from a bad or a superficial one? What criteria should we use to judge the examples? When is the assimilation overdone? These are the problems that innovators in music and fashion world are trying to cope with. In fact there are lessons that one can learn from the initial euphoria for experiments in fusion music, which has ultimately met with only a limited success. Assimilation is still a difficult process to decode. It may be possible to understand it by looking at examples, classifying the strategies used and finding commonalities. The sources of these cross-cultural studies can be varied, from architecture to performing arts, language, fashions, customs and behavior. This points towards an clear agenda for future design research.

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#### Notes

- (1) For more information on assimilation efforts in British architecture in Bombay refer , London C.W., *Edwardian Architects of Bombay*, Marg, Bombay, Vol. XLVI no.1, 1994, pp 35-55.
- (2) Panchang is an yearly publication of astrological details giving the star and the moon positions during various segments of the day. It also details auspicious times for certain events.
- (3) Assimilation of ideas and forms from British tradition into Indian literature, contributed in evolving a new identity. These have not been referred here. For more details in these areas refer, Das A., *India : Impact of the West*, Popular Prakashan, Bombay, 1994, pp 66-79.

# GRAPHIC SYMBOLS FOR ENVIRONMENTAL SIGNAGE: A DESIGN PERSPECTIVE

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## Abstract

'Symbols' conceived in the context of environmental directional signage, and one that is specifically intended as a public service facility, is being seen here as having the potentials for constructing an effective graphical interface between the user and the intended facility; the objective is to facilitate the activities of locating, identifying, informing and directing the user through the various gamut of activities of a given service facility. This paper has been written from the perspective of the designer, who is the producer of these representations, and who seeks to appropriately construct these representations through an amalgamation of approaches viz., the generative approach, which consists of a search for effective images; and the constructive approach, which comprises one's ability to visualise images that are required to be converted into graphical symbols. It is being contended here that these graphical symbols have to be

conceived from the point of these being easily recognisable, and hence represent themselves as a derivative of contextually familiar images. It follows, therefore, that when there is sufficient iconicity or resemblance between the visual representation and the content it refers to, these are relatively easy to visualise. But when this is not the case, the representation of the message areas could need methods that would have to attempt to understand/visualise how these are perceived by the user, and only subsequent to which can emerge as a result of such visualisation. Assuming that the designer uses one of the above methods, or uses his own interactions within the environment as a substantive basis, or draws upon a reserve of existing solutions; and then evaluates and identifies the semantic requirements of the said image; he will now be required to convert these into an appropriate symbol. This aforesaid process is being considered

as a method for constructing a level of visual order, where the paper tries to identify and isolate these very formal features that go to define the characteristics of the graphic 'symbol'. Such identification of the necessary syntax eventually helps to articulate the visual language that seems to govern the process of symbol design. As an interesting extension of the above mentioned methodology, one could formulate a set of formal modifications of structural constructs for these representations, that might lead to having a diversity of visual styles in a manner similar to variations offered by typefaces (this portion has been excluded in this summary). For my paper, this processual section has been followed up by a case study of symbols designs which are meant to serve as part of environmental signage for public hospitals located in urban India.

## Introduction

Visual representations (as graphical symbols) can be used effectively as a communicative interface where it concerns human interaction with a public facility; especially in matters of identifying and denoting the various functions (of a given public facility); and which constitute a part of environmental directional signage. It is always desirable that the communication of information issuing from these interfaces is not misleading or confusing; it should, on the other hand, be revealed as fast as possible. In other words the information must be communicated properly, efficiently and conveniently.

The use of visual representation seems appropriate for the above-mentioned requirements. Apart from obviating the need for having to 'learn' any convention (except where the semiotic category of 'symbols' is being used as a representation), there is additionally the merit of accuracy of image-recognition and the speed of image

processing - factors that definitively favour the case for visual representations (as against the use of texts) when used for the above purpose of communication<sup>1</sup>. There are, however, limits to which visual representations can communicate a message conveniently. First of all, not all information that has to be communicated can be accurately represented by a representation. Secondly, the same representation could give rise to varying interpretations. A given representation could also change its meaning depending on the context in which it is being viewed. Further, in a pragmatic sense, the skill and accuracy required to reproduce a representation could lead to problems. However, in spite of the above handicaps posed by the use of visual representations, we still need to consider the felt-need for an alternative language that communicates adequately across language barriers and across illiteracy<sup>2</sup>. We realise also that if one were to consider the advantages of visual representations, simultaneously keeping in mind their limitations, we could possibly use these attributes to critically define the characteristics of such a representation. Over and above, it is hardly necessary here to emphasize the overriding need for such a mode of communication to restrict itself in terms of a simplicity of visual statement, which allows its meaning to be conveyed in an easily identifiable way.

### The visualisation process

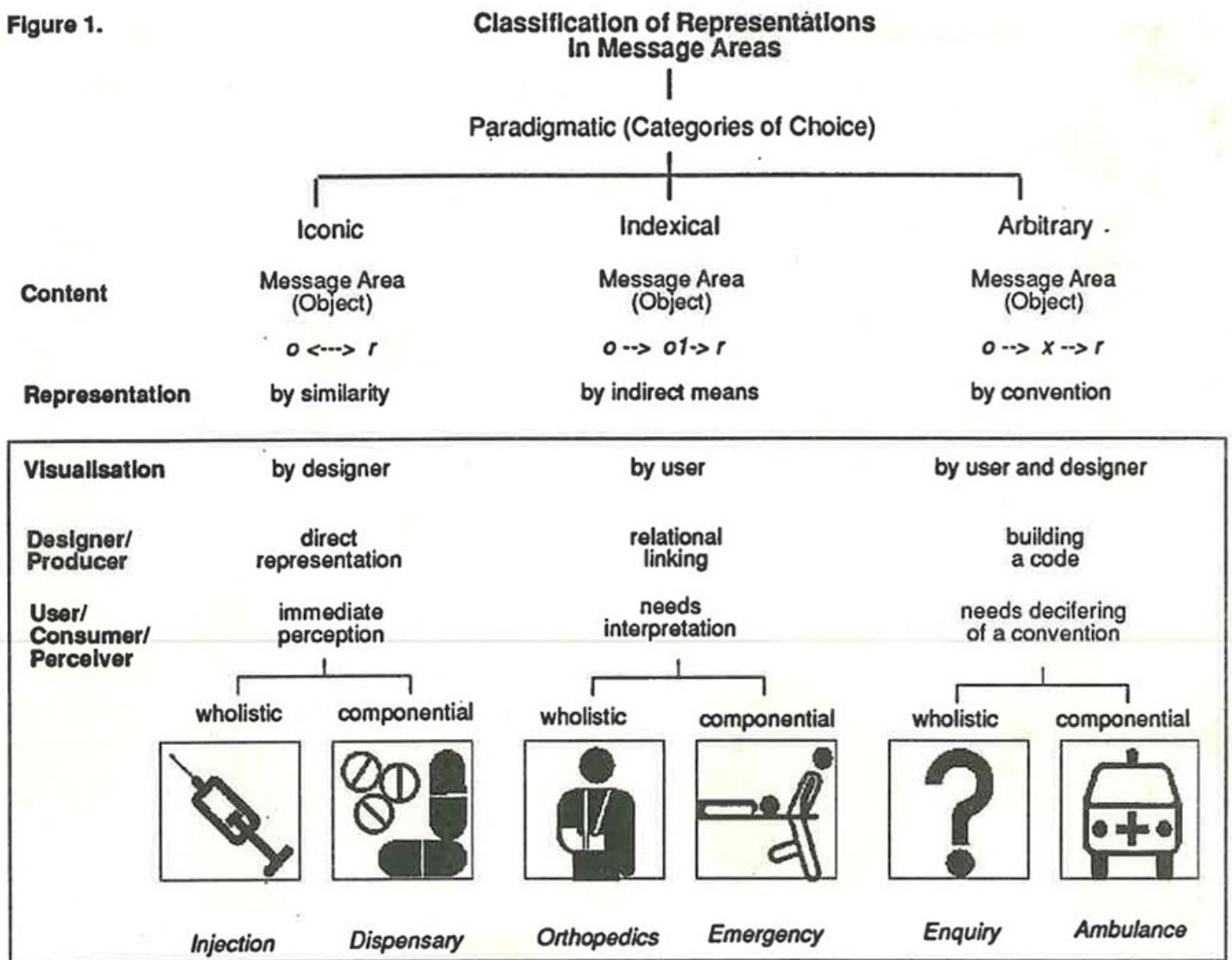
A first step in the process of designing these would be to identify the various aspects of a given public facility that need to be represented for communication purposes, by graphical symbols that will serve collectively as an interface for the user. The different aspects of this environment would usually include its facilities, its functional and organisational attributes, and certain informative and warning messages. For the sake of convenience we will refer to these various aspects as the 'message areas'. While considering their potentials for visualisation into visual representations, the possible representations emerging under these various areas may be classified (refer Fig. 1, pg 31) using the Peircean Trichotomic Model of the semiotic process as

- Iconic
- Indexical
- Arbitrary ( being referred here as arbitrary instead of as 'symbolic' in order to avoid a clash with the term graphic symbols)

#### **Iconic representations**

The message area in this case offers enough physical clues to be converted into a visual representation through factors of similarity or resemblance. The high degree of iconicity inbuilt into such representation makes for an easier understanding that is a valid requirement for image-production. Such representation also usually bears a high degree of familiarity in the perception of the user. It follows, therefore, that for a designer to design a symbol in this A

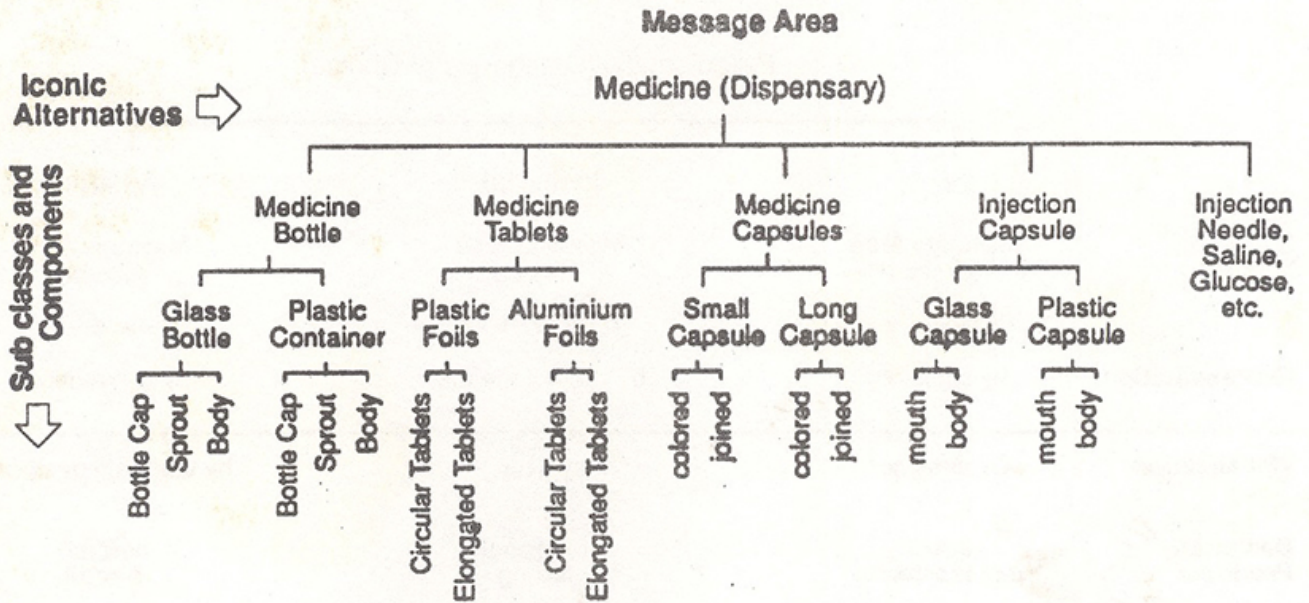
Figure 1.



category of iconic representations, a proper understanding of the message area would be quite sufficient to transform the same into an appropriate symbol. A method for visualising a message area would be to systematically categorise (refer Fig. 2) the given message area along the horizontal axis in terms of its iconic alternatives followed by a classification of these along the vertical axis into its subgroups, and further in terms of its identifiable visual components. In this modified model, each category within a taxonomy is entirely included within one or the other category at a higher level<sup>3</sup>. This mode of categorisation allows us the following advantages:

- (i) a recognition of the generality inherent in a representation;
- (ii) an identification of all the essential elements and their components that are required for the representation;
- (iii) the highlighting of a relative importance of a representation in terms of other alternatives; and
- (iv) establishing its relation to the given message area. This process offers us a basic and viable framework of alternatives from which to derive the possible representations for a symbol. Even if the message area is representable by means of resemblance, there still would exist many differing ways in which the same solution can be represented.

Figure. 2 : an example of the Iconic categorisation of a message area



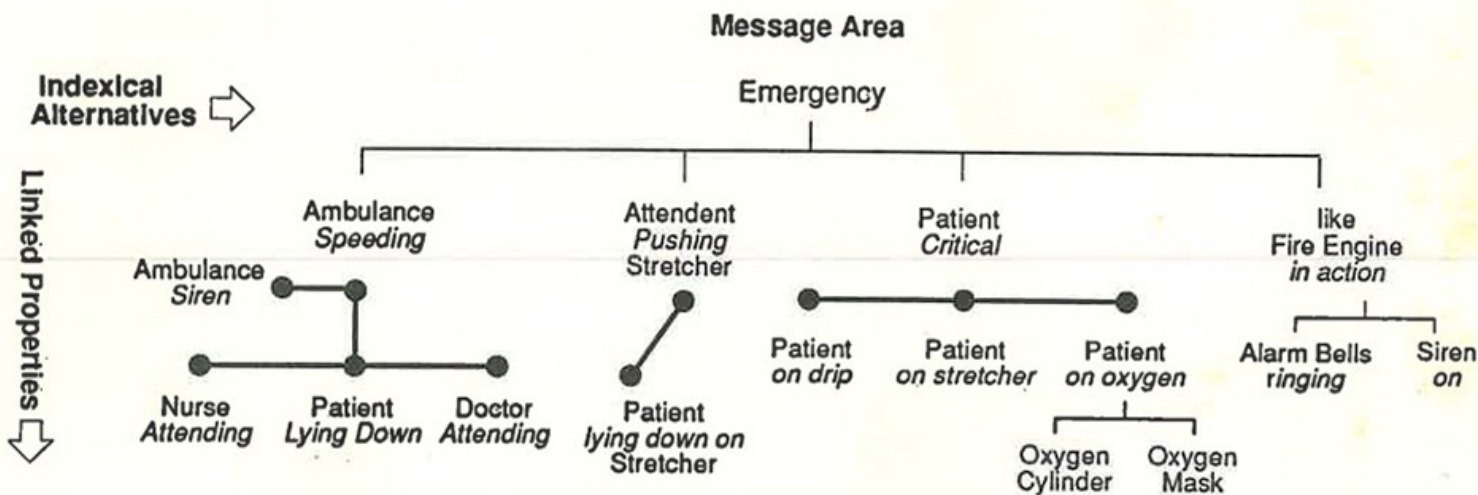
given representation could vary, for instance, in terms of the choice of a certain viewpoint; or in the choice of the representational mode- for example either a perspective or isometric; or, in the choice of the medium of representation- pencil, ink, or paint; or in terms of whether the form of the representation has been filled as against a choice of outlined forms. It is best to weigh these options by comparing these representations with other potential ones and then choose the one that would best represent the required message. We find that such a representation can either be single and wholistic, or be a composite of several components. An example of the latter is that of the 'dispensary', where several individual components placed next to one another are essential towards formation of a symbol. Iconic solutions seem to be logically the most suited for representation of message areas as symbols, because of their immediacy of information recognition and retrieval. Fortunately, a majority of the message areas seem to offer solutions in this category.

#### Indexical representations

Here the message area does not offer enough direct clues and hence the relationship has to be architected indirectly using secondary devices. These message areas are usually concerned with the ones that are concept-based, or are related to ideas or expressions and are not easily translatable into a visual representation. The meaning of these message areas are to be conceived by means of other devices so that these, in turn, transpose their essence to the given representation. Also such representations can best be summed up as being the output of the user's conception of his familiarity with a given facility. The designer acts as a vehicle in interpreting the visualisation that has been perceived by the user. The design of the emerging symbol is obviously, thereby a construct of the images that the user is able to conceive about these message areas. A viable method is, therefore, required to be formulated to understand the visualisation of these

message areas into appropriate images through an interaction with the user in a manner such that it offers the essential semantic clues required for the final symbol. It is known that the human mind encodes the real world using concepts related to each other in terms of linked associations. "Our perceptions are structured into units corresponding to objects and its properties. These units may be generated into images that are experienced as quasi-pictorial, spatial entities"<sup>4</sup>. Clues are gathered from the verbal description of the message area as has been perceived by the user's imagery (it is

Figure. 3 : an example of the Indexical categorisation of the message area



assumed that the general user is much more comfortable and adept at interpreting his concepts of an idea through the verbal language rather than by means of drawing or illustrations). The user is also prompted to visualise the attributes of the message area through a classification of the message areas into its components, followed by a visualisation of their associations, and then link these up with similar images. These verbal descriptions are categorised as possible alternatives, and diagrammatically linked in terms of their spatial arrangement; an exercise that is expected to help in finding alternatives for representation of these message areas. By this method it is hoped that the user is also able to provide inputs that are culturally-derived and context-oriented, and at the same time allowing for a visualisation of the message areas that remains as close as possible to his perception.

#### Arbitrary representations

Sometimes, we find that the message area or certain aspects of it are best depicted by using an arbitrary sign. Such a sign either makes use of an established code or convention for its representation as symbols, or these conventions are required to be worked out afresh. The repeated application of this over a period of time itself makes it recognisable enough for the user, and this process enables him to learn these conventions. The way to generate this category of representations would be to uncover an existing convention that could be used for adoption and modification; or, by converting certain existing associations into a convention. Examples of this

practice are the use of red cross as a sign for medical aid; or the use of an outline form (filled in white) to denote the hospital staff and facilities; as against the use of filled forms to depict the patients and the general public. These representations have a tendency to be contextually dependent, and to that extent are restrictive in their application.

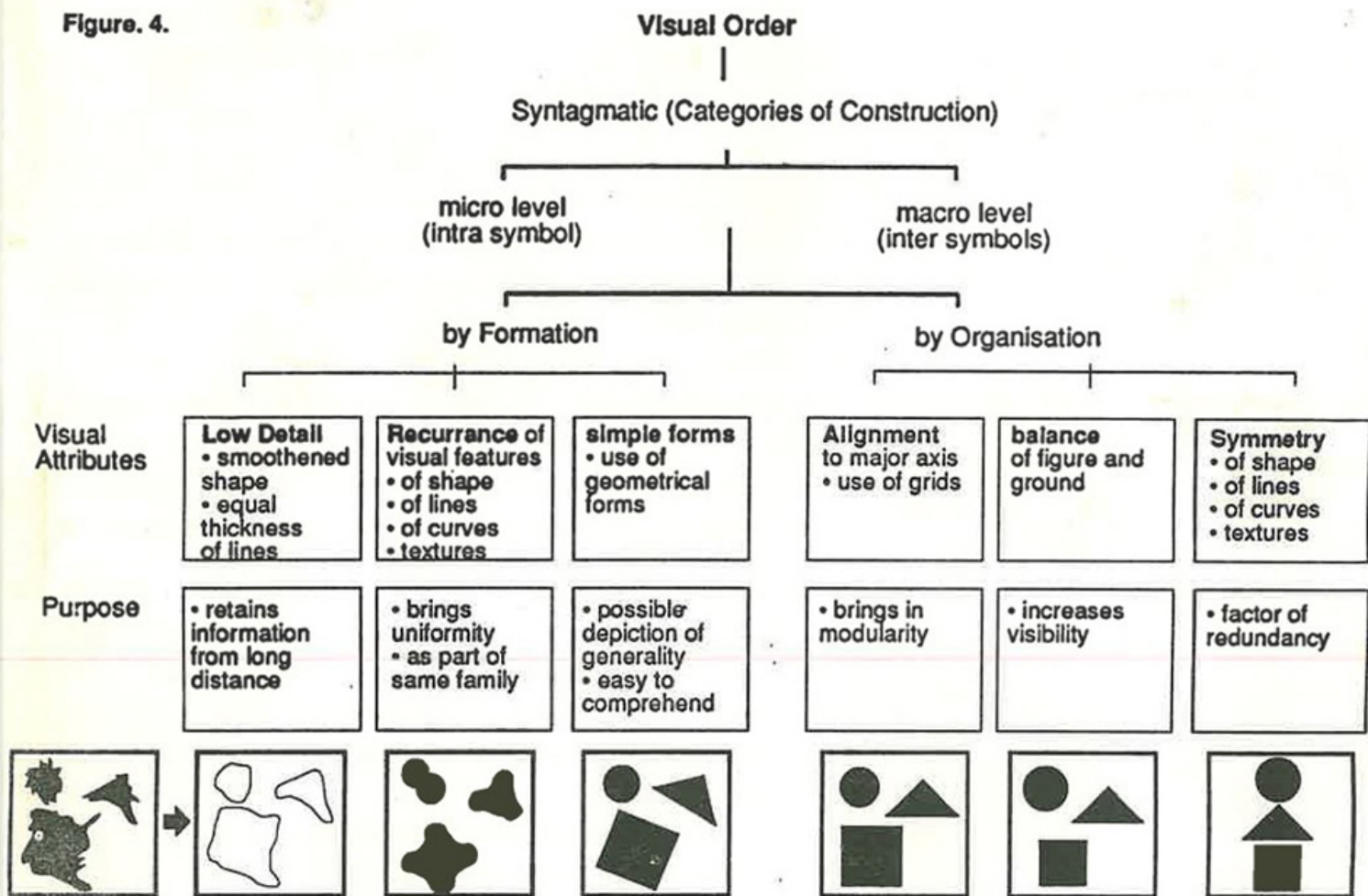
Having semantically articulated the images necessary for the visual representation of a message area, we now turn to the stage where we begin to convert all these alternatives into simple drawings. Upon which, this bank of possible solutions are subject to evaluation in terms of the responses generated among the users. The results are then tabulated and out of the whole set, two or three representations, which are considered semantically more appropriate solutions than the others are further taken up for the following phase of the process. The above evaluation may lead to a selection of more than one aspect of the possible alternative representations that are eventually taken up for a synthesis into its final design. The next stage would involve incorporating syntactic features that would make these drawings into a graphical representation appropriate for use as a part of signage for public facilities.

#### **Towards the constructing of a 'symbol'**

Here is an attempt to identify visual attributes that are essentially formal in their characteristics, and are considered indispensable towards designing the character of a graphic symbol intended for use as part of signage. This part, where the designer imparts the qualities of the graphic symbol into a representation, reflects a constructive approach. His contribution towards this endeavour constitutes one of a systemic organiser who generates and modifies the visualised image into a graphic symbol using syntactic means, while simultaneously preserving its semantic content.

A relatively high degree of order seems to be the key factor underlying the characteristics inherent in the representation of a graphic symbol; and it is this factor that differentiates it from other forms of representation. 'Order refers to the degree and kind of lawfulness governing the relations among parts of the representation. It applies to the over-all theme or structure, to which the relationship of all parts must conform; it also applies to the makeup of each part within itself<sup>5</sup>. The visual principles (refer fig. 4, pg 35) that need to be exploited to achieve a relatively high level of order have been identified as comprising factors such as low visual detail, recurrence of forms, simplicity of form, alignment to grids, symmetry, and the balance of figure and background. At the next level, the order is influenced by visual features (refer fig. 5, pg 36), such as the use of shapes that are simple, smoothed, geometric; textures that are even; tonal variations that are minimal; orientations along the horizontal, the vertical and

Figure 4.



diagonal axis; and size variations that are modular. At the third level, elements such as lines that are used as outlines and in turn act as efficient containers of information, are treated in the manner of having an orderly even thickness, a geometric linearity or circularity and are constrained in its direction to the major axis or the diagonal. In Arnheim's opinion 'Order tends to reduce complexity and requires elimination of details that do not fit the principles determining the order' (1966). The above-mentioned attributes that modify order have to be seen as influencing, at a close-up distance of a micro dimension, - the relationships within a symbol; and at a macro dimension - the relationships across the whole group of symbols. All these transformations bring about visual uniformity within and across symbols; apart from restricting the information to the necessary details alone, as well as increasing the graphic quality of the representation.

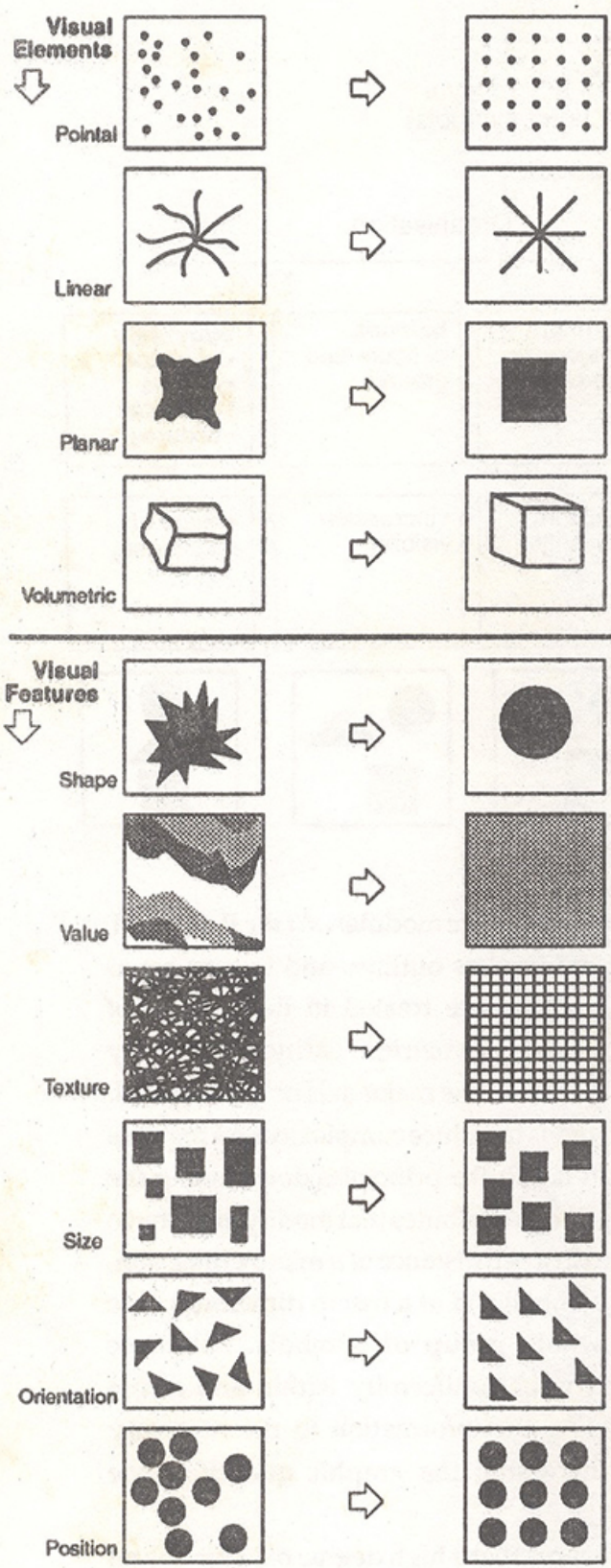
Here are mentioned the influences that a high degree of order has on a given representation:

• *order denotes a relative extent of generality:*

Symbols usually have to denote and represent or stand for a whole class of objects/artifacts. This is a function that representations in verbal language undertake effortlessly by categorising and standing for a particular group. Further, by assigning a certain level of visual order in terms of simplified forms and details, the visual representation

Figure 5 .

Increasing levels of Order →



tries to denote objects with a certain degree of generality.

• *order strengthens a given representation:*

For a representation used in a signage to be visible from a distance it is essential for it to have the strength to stand out from its surroundings and be recognised for its representation of the given message area. A strong figure against the background, a certain amount of thickness for the lines and the use of symmetry are factors that can lead to this visual potential.

• *order smoothens the definition of the representation:*

Representations that are viewed from a distance have the tendency to smoothen out perceptually. Sharp details, textural details, angular shapes and such details tend to become less prominent. It is always preferable to pre-smoothen such details so as to avoid distortion of information when viewed from a distance.

• *order brings about uniformity:*

By following the same rules of imparting visual order it is possible to bring about uniformity in the visual features, both within and across the symbols. Such a group of representations could logically be identified as belonging to the same family.

• *order leads to learning:*

Order tends to reduce complexity and arranges the various elements of a composition in an organised manner. This makes for easier comprehension, recognition and remembrance, leading to an overall enhancement in the quality of retrieval and processing of information.

The design process involves incorporating these attributes into the representations that have been selected after evaluation by the users. The above-mentioned factors that contribute towards (i) the formation of visual simplicity through a reduction of complexity, and (ii) a rearrangement of its elements in an organised manner, must be integrated into representations. Conventions dealing with achieving the required level of order have to be followed universally so that this leads to a modicum of uniformity across an entire family of symbols.

Hospital symbols: a case study

Communications in India is constrained by factors arising from the very diverse cultural, traditional, lingual and social backgrounds of its people - resulting in potential as well as real situations of communication impasse. A drawback of no mean proportion, it is related to the simple linguistic and cultural fact that in India, there are as many as 14 major languages and about 1,600 dialects. Secondly, many of its adults are perhaps functionally literate but are literarily illiterate. Thirdly, people do not communicate easily because of boundaries determined by the cultural-traditional-social denominators of gender-divide that limits the free mixing between the sexes, or among different castes or religious communities.

### *Need:*

At the very outset it was discovered that there was no existent data pertaining to the problem of message communications in the domain of health-care services. One reason for this being that at the time of our study, Indian hospitals by and large, did not employ any system of symbols. Five major hospitals, run either by the government or the municipality within the city limits of Bombay, were therefore chosen for a study of the potentials of symbol development. The results of the study revealed that there were several problems deriving from the absence of a sign system:

There was a great degree of confusion that resulted from using a number/numerical system for identifying the departments, counters, etc. It was found for instance, that 35 - 40% of the first-time users coming to a hospital to utilise health services, invariably ended up standing in the wrong queues. This not only caused loss of time for the user but also undermined efficiency as a consequence of the considerable confusion and delay caused on both sides - on the part of the patient, as well as on that of the hospital staff. Since the queues were lengthy on account of high patient turnouts, the patient often wasted over half an hour to simply realise his error.

It was felt that visual symbols, appropriately used could go a long way in ameliorating these avoidable conditions.

### **Methodology**

Broadly, the approach was the creation/generation of a large set of possible solutions which were to be narrowed down and graphically refined until the final set emerged. The design solution also involved a dialectical movement between the designer and the user, and the process was modulated by responses from the public (refer to fig. 6, 7 and 8).

- Message areas :** As a first step, all the major facilities where a symbol was necessary, were identified and classified according to their potential for representing in the iconic, indexical and the arbitrary categories .
- Variations :** In order to generate possible solutions pertaining to each message area, three methods were employed.
- from designers :** First, creativity sessions were held involving designers in order to generate solutions mainly for the iconic and arbitrary category of representations.
- from users :** Secondly the public themselves were requested to propose solutions mainly for the indexical category of representations. They were interviewed with the aim of finding out what association they had regarding a particular message area. Key words related to the images visualised by the sample users were documented. These were then visualised into possible visual representations by the designer.

<b>from existing solutions</b>	Thirdly, existing international solutions were documented. This procedure resulted in the accumulation of a large number of alternatives for each message area.
<b>Evaluation by the people</b>	The next stage consisted in going back to the public for an evaluation. Without volunteering any information, the public was shown the complete set of possible solutions for each message area and asked to mention what these represented and to identify the ones which gave them sufficient clues towards identification. When the results were tabulated, it was discovered that out of the whole set of possible solutions a few were semantically considered more appropriate than the rest. These few were then passed on to the next phase of the process.
<b>Ergonomic and system attributes</b>	Following this was the pragmatic phase where ergonomic studies were done on aspects like visual distances, amount of relative blackness perceived, minimum thickness of lines, and the required enlargements. Decisions at a macro level in the semantic and syntactic domain were formulated across message areas so that it became a convention to be used in all the symbols for a given environment (e.g.; the patient in black and the hospital staff in white, the roundness of form, the character of border, etc.)
<b>Redrawing of symbols</b>	In the light of all these studies and evaluations, the symbols were redrawn incorporating ergonomic features and established standards, and then made to syntactically match with each other. The designer's task was to work them over and refine them so that they were graphically more compatible with each other.
<b>Re-evaluation by designer</b>	Next the designer evaluated the symbols for ease of recognition and for syntactic compatibility.
<b>Redrawing of the symbols</b>	The symbols were corrected and redrawn.
<b>Operation test on site</b>	The final stage involved operational tests on site for checking out the effectiveness of the designed symbols.

Figure 6.



- Special ward
- Dispensary
- Enquiry
- Canteen
- Lift

- General ward
- Laboratory
- Keep Silence
- Drinking Water
- Ambulance

- Isolation ward
- Injection
- No Smoking
- Telephone
- Exit

- Toilet
- Staircase

Figure 7.



- Man
- Man
- Male Doctor
- Orthopedics
- Cardiology

- Lady
- Lady
- Lady Doctor
- X - Ray/Screening
- Respiratory

- Rural Man
- Pediatrics
- Nurse
- Dressing
- Urology

- Nursary
- Pregnancy
- Dermatology
- Gastrology

Figure 8.



- Medical examination
- Ophthalmology
- Dentistry
- Registration
- Gents Queue

- Operation theater
- ENT
- Physiotherapy
- Medical School
- Ladies Queue

- Blood donation
- Neurology
- Handicapped
- Thrash bin
- Gents Toilet

- Emergency
- Psychiatry
- Waiting room
- Ladies Toilet

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# Design Inputs into Craft Areas Implications for Rural Development and Employment Generation

A.G.Rao

*Key note address at the Vth International Bamboo Workshop held at Ubud, Bali, Indonesia on invitation of INBAR (International Network for Bamboo and Rattan), I.D.R.C. (International Development Research Centre, Canada) and Environmental Bamboo Foundation, 19 -22 June, 1995.*

## Abstract

*Craft needs to be understood in terms of the deep significance it has as an expression of unconscious creativity and an employment generator. In Japan, bamboo craft has reached high standards getting the status of Art. A fresh approach to craft in developing Countries is*

*necessary to recognize craft as an art form, industrial activity and a means to develop creativity in general education. Design has evolved from craft. Design inputs into craft can carve out a place for 'Bamboo Craft' for viable employment generation in rural areas. Action*

*programmes like 'Inter designs' and 'Exhibitions on wheels', in addition to conventional research are required to rejuvenate 'bamboo craft' in the rural areas of developing countries.*

## Introduction

Crafts have a deep significance in our lives. Traditional craft stands as an example of 'unconscious creativity of man expressed over generations'. Industrial design evolved from 'craft' as mechanisation took command of the production process. Crafts lost their central place in the daily lives of people with the all pervading industrial culture dominating the scene. Craft creations became objects to be seen in the museums. However folk crafts continued to survive in the developing countries, taking poverty and exploitation as their new shelters. Crafts will have to have 'economic viability', in market economics, if they have to continue to play a meaningful role in our lives. Let us see how 'design' can play a role in rejuvenating 'crafts' taking bamboo craft as an example.

Use of bamboo and practice of Bamboo Craft is noticed in countries like China, India and Korea from ancient times. Early evidence of bamboo weaving in China, can be seen in a museum piece of early times. But today we look at Japan for excellence in Bamboo Craft. High quality of a Japanese basket has many things to say. But what is its relationship to the poor and unemployed in the developing countries, who have abandoned their 'craft', looking for any employment? For many people appropriate employment means better nutrition, better health and hopes for the future. Only such hopes can make school-education and family planning meaningful to them. Lack of employment in rural areas and consequent exodus to metropolitan centres, are serious problems facing the developing countries with large populations. Economic development through 'capital intensive' industrialization has accentuated this problem. Unlimited use of natural resources in the industrialization process has led to ecological damage as well as environmental degradation. In this complex scenery, surprisingly, bamboo as a rapid growing

resource and Bamboo Craft as a rural based occupation offers a ray of hope, a solution in the right direction.

In the craft sector, 1 tonne of bamboo could provide 100 - 300 man-days of work for craftsmen. Taking an average of 150 man-days per tonne, raw material to provide work for one bamboo craftsman for one year will be 2 tonnes. This means 2 million tonnes of bamboo can create 1 million jobs.

Taking India as example, current rate of bamboo production is 4.5 million tonnes which can be increased to 11 million tonnes according to an expert opinion (N.S.Adkoli 94). Allotment of 20% of bamboo production for 'one million jobs' seems to be an attractive proposition if an economically viable job opportunity can be provided to the bamboo craftsman in rural areas.

Let us look at the current scene. Bamboo craft has been practised as a folk tradition to make objects of daily use in many developing countries. Though large number of families including women and children, depend on bamboo craft, the earnings have been low. In Sri Lanka a bamboo worker gets an income of Rs.5000/ ( U.S.\$ 118) per year. In India it would be around Rs. 20 to 30 ( little less than a U.S. dollar ) per day for semi skilled craft person. In Thailand it is 20 to 60 Baht ( 1 to 2 U.S. dollars ) per day. Employment in bamboo craft in rural areas tends to be seasonal. The same workers get hired as agricultural labourers. Another reason for low payments for crafts has been the 'castes' they belong to. In Sri Lanka and most parts of India, bamboo craftsmen belong to castes with low social status. But in places like North Eastern India where high skills exist, a bamboo craft worker who has moved to urban centres can command a salary of Rs.5000/- (U.S.\$ 118) per month (i.e. 3.5 dollars a day). Continuous employment with an earning of Rs.1500/- to Rs. 2000/ ( i.e 50 to 70 U.S. dollars) per month, in bamboo craft, would make it an attractive trade to pursue for a villager. Such a possibility needs to be explored.

#### Understanding Craft as Profession

Historically craft has been skilled work to create objects of utility. Over the years high ornamentation characterised 'craft work' patronised by the elite and rich of society. In comparison, folk crafts which met the needs of the masses remained simple. In harmonious social settings the unconscious creativity of folk crafts excelled. The result was an expression of simplicity with elegance in use of the material and the process. The orderliness of the creator of folk craft reflected in the orderliness of the construction and details, often resulting in high level of product aesthetics. Every part of the product was functional, minimal but elegant. An earthen pot and a bamboo basket are good examples.

With the advent of industrialization three things happened.

1. Industrial design emerged as a substitute to craft, to take care of 'aesthetics' suitable for mass production and mass marketing.
2. Crafts appreciated by the rich and elite acquired a status similar to 'Art' with some of the craft pieces reaching the museums.
3. In certain parts of the world less touched by industrialization 'craft' continued in its earlier forms.

In most of the bamboo growing developing countries bamboo craft continued as a folk craft.. But in Japan it look many strides worth taking a detailed look.

### Bamboo Craft in Japan

"In Japan Bamboo has been widely used as daily utensils such as baskets, table ware, utensils for tea ceremony, utensils for religious ceremonies, weapons, armor and as architectural constructions such as fences" (Kenji Keneko). Chinese style baskets which came along with Buddhist monks became popular. Fine weaves of Chinese baskets slowly replaced rough weaves. Japanese craftsmen soon started innovating new designs after adopting the Chinese styles. Bamboo baskets called 'Hanabako' and 'Kara' used for carrying and cleansing flowers, excelled in number of designs during Tempyo period. A total of 565 varieties of baskets which originated at this time, exist till today. But bamboo craft took new shape with craftsmen like Rokansai Iizuka, followed by others. They converted bamboo into an Art form, bringing the status of 'Art', to bamboo craft. A recent flower basket 'Sankai' by Azuma 'Chikuensai (1969), with fish net weaving is a good example. There are 70 different weaves with names like pine needles, turtle shell or ajiro, fish net, etc.

Various basket forms and weaves of Japan reveal the creative potential in bamboo craft. Japanese crafted baskets are like Art-pieces and very expensive today. Bamboo craft is also used to create high bracket products produced in large number. An integrated approach to develop such product is adopted in Japan. For example Industrial Arts Institute at Beppu, originates product ideas from market needs to prototypes. Even appropriate technology is developed and passed on to craft workers. Today Japan imports bamboo crafted products like baskets, as the cost of local produce which is of high quality, is three times to that made in countries like China and Taiwan.

### An Approach to Bamboo Craft in Developing Countries

We need to take a fresh approach to bamboo craft in developing countries which ensures a status in addition to generating employment opportunity in rural areas. For this it is imperative to recognize bamboo craft as an Art form, as an industrial activity and a valuable input in general education. Integrating craft education as a stream of design at various levels is vital in this endeavour.

### Bamboo Craft as 'Art Form'

Though it may look like a luxury for developing countries, bamboo craft needs to be seen as an 'Art form' to ensure the creative surges which are needed to keep the craft alive. In Japan, bamboo craft as an 'Art form' had set the standards of aesthetics for the flower baskets. New experiments in form, finishes and details are done in the process of art creations. These percolate to the regular products when local craftsmen adopt them. In effect 'Art-like research' will be a source of new ideas for bamboo craft. Art activity can ensure that the craft is fashionable and helps to keep it in vogue through media influence.

### Bamboo Craft as Industrial Activity

To achieve higher level of commerce and consequent employment generation in the trade, bamboo craft needs to be recognized as an industrial activity. Bamboo craft industry needs to have no inhibitions to make use of machinery, whenever it is advantageous. Crafted parts can be judiciously mixed with machine-made parts, in bamboo and other materials. Economic viability in the long run, and competitiveness with mass produced products made in plastics, etc., can only be achieved by seeing bamboo craft as an industrial activity.

### Bamboo Craft in General Education

Potentials of craft learning in general education are yet to be recognised. Specialists in the development of 'creativity' are concerned about the neglect of 'right brain learning'. It is now known that right side of the brain deals with emotions, aesthetics and intuitive thinking whereas left side of the brain deals with language, logical and analytical thinking. Craft can become an important mode of developing right brain abilities. Sheridan Tetsumo in his book "Created in Japan, from Imitators to world class Innovators", attributes much of Japanese success in creating miniature modern electronic gadgetry to the training given to every Japanese child in Origami paper craft. Art, Craft and Design need to be revitalised in school education as they form the base for creativity in science and technology later. Bamboo craft offers an excellent scope for such an introduction, in rural and urban schools, in developing countries. This would spur the employment generation of craft teachers as well.

### Education and Training in Bamboo Craft

Bamboo craft traditionally was learnt from the families. Now bamboo craft is taught through Government schemes. In India for example, there are 35 centres which train persons in villages for 6 months. Trainees are given a stipend of Rs.280/- (9 dollars) per month. But the craft trainers themselves do not have scope to update their learning. The craft training is not offered parallel to technical training. It is

important to integrate craft training at various levels. Bamboo Craft should be seen as a part of 'design' for training purposes. Course contents at various levels need to be worked out. This would also provide for crafts persons to acquire qualifications to become craft teachers and trainers in schools and colleges. There is a need to develop educational materials in the form of books, videos, kits and exhibitions to facilitate education of bamboo craft at all levels.

### Design Problems facing Bamboo Craft

Many practical problems face bamboo craft, which are discussed in detail along with some possible solutions.

#### 1. Current mind set

The prevailing mind-set of bamboo craft is that of a "thing belonging to the past". General knowledge of an educated person about bamboo craft is very little to-day. Most of the people do not know even the difference between bamboo and rattan (Cane). Many see it as a poor man's occupation, not so relevant to modern life. Even designers and architects are quite unaware of potentials of bamboo craft.

Such an overall perception has a damaging effect. Bamboo craft person in a village also does not see much of a future in craft, for his children to pursue the profession. There is an urgent need to change this 'mind-set' of diffidence.

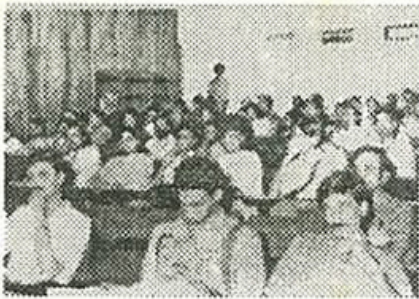


Fig. 1. Jagruti workshop

One such effort was Jagruti (awakening) - a Bamboo craft design workshop held at Industrial Design Centre, IIT, Bombay for a week, in May 1993. 15 professional designers, 15 craft persons and 40 design students participated. Several experts presented papers related to bamboo craft and on 'products' which can be made by bamboo. Half the time was devoted to 'inter-design', where craftsmen and designers came together and brought out several product concepts in bamboo. Results which were in the form of sketches, models and prototypes have been documented in a publication titled Bamboo-craft-Design. Jagruti succeeded in generating tremendous enthusiasm in craft persons and designers, which has led to implementation of few new designs.

#### 2. Research and Development related to Bamboo Craft

Published research specific to bamboo craft is meager. A study and documentation on Bamboo Craft of North East (Ranjan et al) by National Institute of Design, Ahmedabad, India is significant. INBAR has initiated a study on indigenous tools and processes for bamboo and rattan. Engineers of FRIM (Forest Research Institute of Malaysia) have proposed a design of a tool to make thin strips (0.2 mm) of bamboo.



Fig. 2.  
Decorative item

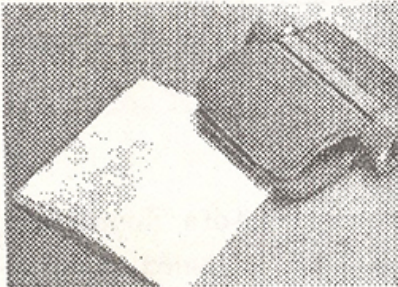


Fig. 3. Paper clip

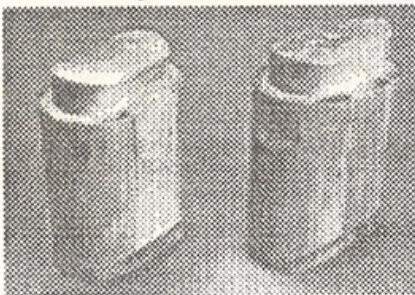


Fig. 4. Salt shakers

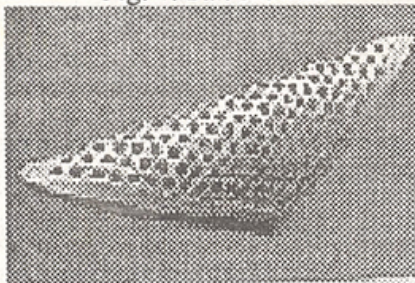


Fig. 5. Lamp

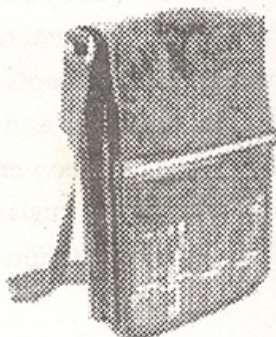


Fig. 6. Carry bag

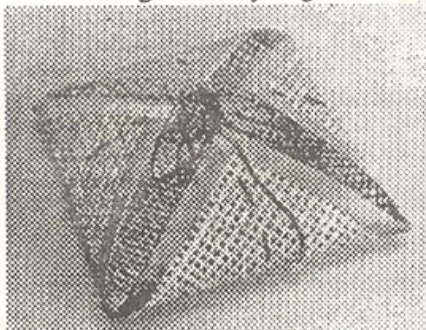


Fig. 7. Gift pack

Some more problems which need research attention are Raw material, Finishes, Tools, Technology and Product Designs. Information flow of available material across the countries has been poor. Research in these areas may include documentation and evaluation in addition to new proposals.

### 2.1 Raw material :

Easy identification of bamboo which is suitable for craft work is a problem. Bringing out a 'manual' on types of bamboo suitable for craft work, with local names, along with the test procedure to evaluate the suitability, would be of high value.

### 2.2 Finishes

Comprehensive documentation of finishes available and how to achieve them along with an evaluation like cost and durability is required. Variety of colours and finishes available needs to be made available, akin to colour charts of a modern paint manufacturer.

### 2.3 Tools

Documentation of tools along with an evaluation and availability will be useful. New tools to achieve finished edges, rims, legs and handles, are needed. Tools which can achieve higher productivity and better quality have attraction for the craftsmen.

### 2.4 Technology

Small scale technologies available across the countries for bamboo finishes, joinery, process need documentation. New technologies need to be developed for bamboo bending, moulding, laminating, and polishing.

### 2.5 Product Designs

Research is needed to develop new product designs in bamboo. In a project done at IDC, IIT Bombay several product concepts were generated under seven product categories.

- SYMBOL 183 \f "Symbol" \s 10 \h Gifts and Souvenirs (fig. 2.)
- SYMBOL 183 \f "Symbol" \s 10 \h Stationery items (fig. 3.)
- SYMBOL 183 \f "Symbol" \s 10 \h Kitchen/household items (4)
- SYMBOL 183 \f "Symbol" \s 10 \h Lamps (fig. 5.)
- SYMBOL 183 \f "Symbol" \s 10 \h Furniture
- SYMBOL 183 \f "Symbol" \s 10 \h Carry items/containers (fig.6)
- SYMBOL 183 \f "Symbol" \s 10 \h Packages (fig.7.)

Continuous research is required to evaluate where bamboo crafted products can become competitive. Even 'evaluation procedures and methods' to link to 'design strategies' need to be evolved. Integrated approach, including market needs, product design, technology to achieve the new design, would be important in terms of transfer and absorption by craft groups. Industrial Arts Institute at Beppu, Japan, has evolved a methodology where craftsmen, designers and scientists

work together to evolve new products to be made by craft groups

### 3.0 Marketing and Professional Design Inputs

In rural areas where folk crafts are practised, bamboo products fetch low prices. With the advent of plastic products, many bamboo items have lost rural markets. Increased awareness and fascination for the unusual, have brought markets for bamboo crafted products in urban centres of developing countries. There is also demand in developed countries if the quality is good. Bio-degradability has acquired a great importance in developed countries and bamboo has an edge in this regard. To enter to-day's competitive markets, professional industrial design inputs into bamboo craft are required. At present bamboo craft and industrial design stand segregated. It is important to create structures and situations where professional designers work together with bamboo craftsmen to evolve products for specific market needs. Two case studies are of interest :

#### 3.1 Adi Crafts

Adi Crafts is a small scale bamboo craft industry started by an architect and an industrial designer trained at IDC. Adi Crafts employs 30 workers, many of them skilled crafts men. The unit based in the suburbs of Nagpur, manufactures bamboo lamps which are sold all over India. The designs were evolved by the industrial designer and the craftsmen. Many industrial concepts like segregating components for manufacture, using jigs and fixtures, have helped to achieve high standards. The crafts men get paid Rs.2000/- per month. Many local women are employed. Wages are linked to the number of pieces they weave. Since the designer is also the owner, the design service is economically viable.

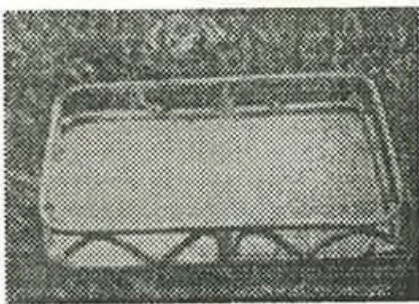


Fig. 8. Tray

#### 3.2 Sign Design

Sign Design is a design office at Pune (India) by two young industrial designers trained at IDC. They came in touch with crafts women from their home town Sangli during "Jagruti". They have developed a bamboo tray (fig. 8.) and few other products working with the crafts persons. Sign design markets the trays in Pune and Bombay. They give contract work to the crafts persons. Now this tray is also included in the training at the centre where crafts persons are trained.

### 4.0 Market based Design Strategies

Crafts have inherent qualities like personal touch and warmth, which are exclusive. Yet, in course of time, they may acquire all the qualities of mass produced products. It is important to evolve design strategies to make use of the strengths of craft process. Some strategies are articulated here.

#### 4.1 Multiple Designs

Crafts process by its very nature can offer wide variety of design

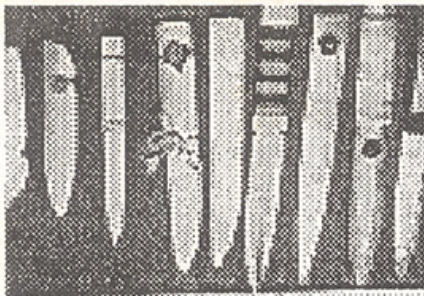


Fig. 9. Paper knives

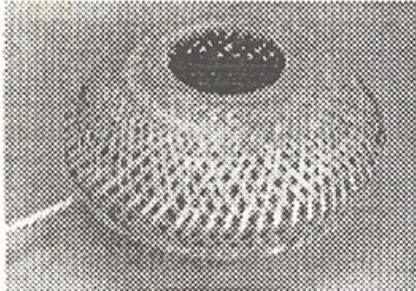


Fig. 10. Mosquito repellent cover

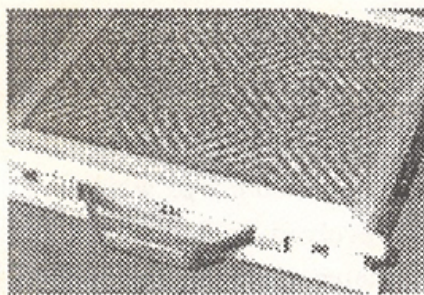


Fig. 11. Briefcase

variations, giving exclusivity to items produced. There is a market demand for such exclusive products especially in gift items and personal ware. Wide variety of designs with similar base structure could satisfy such market demand. India has such a tradition of wide variety in textiles (saris). An attempt made at IDC led to wide variety of designs of paper knives in Bamboo (fig. 9). Initial generation of such multiple designs can provoke the imagination of bamboo craftsmen to come out with expressions of their own

#### 4.2 Add on Design

In this strategy, bamboo crafted items can be added to existing mass produced items to produce "culture friendly" designs. Casings for thermos flasks, thermo- wares, ice-buckets etc can be made in bamboo to offer exclusive items. Bamboo spoons can be sold along with teflon coated frying pans. Woven bamboo cover for a mosquito repellent gadget can make it more acceptable (fig. 10).

#### 4.3 Technology Based New Products

Bamboo woven mats can be moulded into different shapes. Resin impregnation can give a smooth surface. Patterns in the weaves can change to give variety of designs with intricate weaving. Moulded shapes with bamboo mats which are specifically woven for that shape can give a market advantage as compared to the bamboo boards which get compared with plywood in terms of cost, weight and workability. Products like chair shells, brief cases (fig.11), helmets, magazine racks etc. will be most suitable for using this strategy.

### Recommendations

Though conventional mode of 'research' is needed in Bamboo craft, the communication and dissemination at various levels have been the biggest blocks. In view of this following action plans are suggested.

#### 1. Inter Design in Bamboo

Interdesign is a concept supported by International Council of Societies of Industrial Design (ICSID), where designers from different countries come together and solve design problems in a particular area by suggesting new designs in the form of sketches, drawings, renderings and models. Results are published and circulated widely. An Interdesign involving industrial designers, craftsmen, and other experts over two week period can be held. Usually host countries take care of stay and hospitality of participants. Designers bear travel expenditures through their own resources. INBAR could initiate such Interdesign with possible sponsorship of UNIDO.

#### 2. Mobile Exhibition or Exhibition on Wheels

The Bamboo craftsmen at village level remain unexposed to the developments in other countries inspite of many congresses and

seminars. A bamboo craft product exhibition with actual samples can go to the rural places where the craftsmen work. The event can be used to conduct small workshops inviting local designers. Similar exhibitions on wheels are successfully used for science-education by Nehru Science Centre at Bombay.

### **3. Creation of Marketing agency for Bamboo Crafts**

Marketing and orders become the only realities to the financially hard-pressed bamboo crafts persons. An international marketing agency on a commercial basis can become a powerful conduit to bring 'design quality' in bamboo craft. Though there are government run marketing agencies in countries like India, they become ineffective due to lack of accountability. Marketing agencies in private or joint sectors only can ensure newness and quality in craft work. Some companies like 'Body-shop' have a policy to promote craft items from developing countries.

### **4. Design exposure programmes for Craft Trainers**

Craft trainers or teachers are crucial in bringing any change. Exclusive design exposure programmes from 2 weeks to 6 months can trigger the enthusiasm of craft trainers.

### **5. Schemes for Designer-Craftsman Interaction**

Schemes to support professional designers working for a craft groups need to be evolved. In some countries 50% of the industrial designer's fee is borne by government to ensure good design. Similar schemes for bamboo crafted products can invigorate new designers.

6. Educational material on bamboo craft need to be developed at various levels in the form of videos, books and kits. These can be on various design issues for the use of crafts persons.

7. Educational kits for school children to learn bamboo craft need to be designed. Such kits can also be used for persons to pursue bamboo craft as a hobby. Large number of house wives in urban centres pursue hobbies which give them a personal identity. Training in craft and kits to learn craft can spurt employment for craftsmen.

8. Research in 'pedagogy of craft' needs special attention. Comparative studies of 'craft training' in different countries could provide a valuable information to evolve new methods of training. Research into integral approaches which includes training, design and marketing can lead to new models for future.

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# DESIGN AS A STATE POLICY: IMPERATIVES FOR INDIA AND OTHER DEVELOPING COUNTRIES

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## Abstract

*Policies are instruments used by the governments by which pressures are exerted artificially to achieve social and economic objectives till the time whole society becomes aware and begins to exert such pressures on their own. One such objective is development and growth which every nation and society aspires for. In the West, science & technology has been used as an effective instrument for industrial development and growth.*

*Adopting the Western model of growth, India invested heavily in science & technology in the form of research laboratories, training institutions, test centres etc., with 900 such institutions in operation today. India was the first*

*country in the world to have a policy on science & technology and a Ministry of Scientific Research & Natural Resources in 1951, and can now boast of third largest scientific manpower base. Despite all this the pace of development has been rather slow.*

*Economic advantages of science and technology are derived through products, systems and services which need to be designed and only then are made available to the society. A responsive design process therefore provides an appropriate link between science & technology and society to improve the standards of living and create means of employment and growth. It has to be recognised by the*

*policy makers that design in collaboration with science and technology can do just that. Therefore design should form an integral part of any national policy of development which could appropriately be termed as "Science, Technology & Design Policy", to create a cross-catalytic impetus for development.*

*In this paper, post-war industrial and science & technology scene is reviewed with particular reference to India, and some cases of successful design utilisation, to give an insight which could lead us to take effective measures for the future. One such push could be given by a concerted state policy on Design.*

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## Indian Science & Technology

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It is at the height of faith in science & technology that India became free. The biggest problem that the country faced then was economic backwardness, which was attributed to industrial or technological backwardness. It was therefore natural that India adopted a policy of development of science & technology in the hope that it would end our poverty and will become the panacea of all our economic ills. India was the first country in the world to create a Ministry of Scientific Research and Natural Resources, in 1951. We thought that if science could work wonders in America and Western Europe it should do the same for us, without really knowing how the linkages worked there. Since we had no experience of science and had not known how modern science aided invention and technology, we took a very superficial view of science. This was unfortunate but bound to happen. We chose the dogma of science and technology which was convenient and ignored the essence and meaning. We forgot that in the West, science and technology and design were brought together through the economic, social and political pressures to become effective. We invested heavily in science & technology and not in design. Chain of national science laboratories was started under the

auspices of Council of Scientific and Industrial research, Department of Science & Technology, Atomic Energy Commission, Department of Electronics etc. New institutions to impart higher education in science were started. Indian Institutes of Technology were started to do high level research and impart training in engineering and technology; and each state had its own engineering college plus many more privately funded engineering colleges. As a result India can now boast of 900 and odd research laboratories, training institutions and test centres working in variety of areas and the third largest scientific manpower base in the world.

### Indian Industry

As a part of planned development a parallel programme of industrialisation was started. In the late 50's and early 60's many new core public sector industries were set up in steel, energy, mining and communications. Since India had no experience in technology or its development, all the new industries were set up with the help of technologically advanced countries. Western multinational companies also started manufacturing units in India with or without local equity participation. Private industries were also encouraged to develop and start new units. Many of these companies made products in technical collaboration with foreign companies. This was the first phase of technology import. What did we really import? We imported know-how to produce a product along with the capital equipment to produce it. Most of the companies started as single product companies to minimise risk and to avoid high initial costs. Each of these companies imported know-how and capital equipment to produce that very product. This of course costed a lot in foreign exchange but we had no choice at that time. Design came as part of the technology (know-how + equipment) package. If any company wanted to have a different product, another set of know-how and capital equipment had to be imported. Therefore most of the companies resisted change or even update of products. This is obvious by the fact that some of the products selling these days are as much as 30 - 40 years old. A vested interest developed in resisting any change, improvement or renewal of products, and lobbied for status quo. Protection was sought by the monopolistic industry so developed in the name of letting the local industry grow. This was granted by imposing heavy import duties and banning the import of many items. Low quality of products, insulated from outside competition was accepted as a way to keep the Indian industry alive thereby protecting jobs and preventing sickness and at the same time save foreign exchange. No need was therefore felt to absorb the acquired know-how. Most of the companies worked with empirical practices and drawings handed over to them by their principals abroad for years on end. There was no concept of product life cycle. It seemed to be infinity. In the process culture of refinement,

invention or innovation got killed in most of the Indian companies. Loss of confidence in developmental abilities and fear of failure took root. There are many instances of companies where it was inconceivable that a new product can be designed and developed in-house or even attempted.

### Indian Industry & Design

So while the rest of the world was changing fast, Indian technology stagnated and with it product design and development programme could never take off. Public sector which could have given the lead fared no better. Private sector car manufacturers even after making cars for 40 years could not make a new car on their own. So our products suffered from high cost and low quality.

We have now 200 operating enterprises in the central public sector with an investment of about Rs. 40000 crores (USD 33000 million) and an annual turnover of Rs. 55000 crores (USD 46000 million); and an almost equal contribution from private sector. Our growth rate has not averaged more than 6% per year during the last decade. The reason is simple. We took a very simplistic and fragmentary view of science and technology. We did not integrate them well enough to make them useful. We looked for old design, old know-how and old equipment. We became the dumping ground for old plant and machinery. Therefore there was hardly any need felt for interaction between industry and research institutions which resulted in their seeing each other with disrespect and great deal of suspicion. All this happened because we forgot that in the free economies of the west, science, technology & design were brought together through the economic, social and political pressures to become effective. In a controlled economy like ours these pressures had to be brought about through state policy initiatives.

### Technology Import

One of the main attraction for importing technology is the design of saleable products or systems that comes along. Very often we purchase same technology over and over again to produce different products, otherwise we would not have 2 big companies collaborating with one Japanese company to produce 3 different models of 2-wheelers and many other Indian companies buying 2-wheeler technologies from as many Japanese companies. So we are paying many times over for the same technology. The fact is that industry is not interested in technology per se. They are only interested in making products which they can sell at a good profit as any business would be. If these practices continue, there will be perpetually dependence on foreign technology and design - the situation which no self respecting nation would like to be in.

Keeping in view the existing situation it seems that technology import is imperative as long as sufficient capability to develop indigenous technology is not build up. This can only begin when sufficient design capability has been developed. To start the process we should use design to create and make variety of products from the same/existing technology. This would also help in complete absorption of acquired technology and would pave the way for further growth as the confidence in indigenous capabilities will grow. Challenges thrown at technology by designers will be easily accepted and executed resulting in overall accelerated development. There may be many failures, but these have to be taken in the stride as that is part of the process and as a stepping stone to success. This is the scenario that we should aim at - where design becomes a vital and dynamic link between technology and society so that there is overall growth due to cross catalytic reaction that a proper design utilisation can start.

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### National Design Policy

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India's Science & Technology Policy 1987 announced by the government of India mentions, "Technology must suit local needs and to make an impact on the lives of ordinary citizens, must give constant thought to even small improvements which could make better and cost effective use of existing materials and methods of work. Our development must be based on our own culture and personality". If we analyse this statement or programme it can in no way be executed by science alone, nor by technology alone, it straightaway falls under the domain of design - first part in engineering design and second part in industrial design. So I reiterate if we want to use our science and technology fully we must include design in the policy statement and be absolutely articulate about it so that in India also the trio works in unison to realise the policy goals. I take another statement from the policy "It is true there is a whole host of problems in these areas (industry, agriculture and rural development) but the solution of them can be simplified by the applying of technological knowledge available". Now which discipline is more capable of doing or effecting this 'simplifying' and 'applying'. Design again comes to mind and yet the whole policy statement is absolutely silent about design.

With the above arguments I have tried to prove that design and its development is as essential as science & technology development. Design should, therefore form one of the important constituents of our policy for development. It should be articulated and should consciously be made part of any developmental activity. Science & technology policy should be redrafted as science, technology & design policy.

If we agree that design should be promoted for all the above reasons then what kind of design should we promote? Since design is a holistic and integrating (synthesizing) activity both technical aspects which impart usefulness to products as well as humanistic aspects which make the products usable, should be promoted simultaneously. Technical aspects include engineering, choice of materials, mechanisms etc., while humanistic aspects include ergonomics, use, handling, safety and acceptance. It has to be seen that the promotional emphasis is balanced and equitable to derive maximum benefits.

Besides developing and utilising design capability per se, there is need to develop design management capability along with the technology management capability. Both these areas have not been yet considered worthy of attention in the policy document. Due to the nature of design process, management of design is quite different from production management, materials management or labour management. Design management involves the management of highly skilled and creative people with different set of aspirations and motivations. It involves management of product development strategies. One of the chief differences between design management and other managements is the variability of control which is loose in the beginning and gets tighter and tighter towards the end of the design process. As the principles of design management are now well known the engineering and other management graduates should be exposed to these principles and full fledged training programmes envisaged for future.

### Design utilisation

Design utilisation can be classified into two user segments. One is design for industry which include big public and private sector undertakings as well as small scale sector. This design is already taking place but the pace at which it is going on, its perceptible and social impact is limited. The other segment which is fertile for design inputs is the design for utilities and services which include transportation, traffic, health, communications etc. The design inputs in this segment can make perceptible and immediate impact. The improvements can be seen quickly and widely. For example Indian Railways can become biggest receiver of design services if it recognizes the need for improvement in speeds, carriages, rolling stock, passenger facilities etc. Unfortunately Indian Railways has kept only 0.2% of its total outlay for such developmental activities. Our aviation industry can tap the indigenous engineering & industrial design talent to derive some benefit as well as help develop it further, preparing it for complex tasks and challenges ahead. With this approach the state which controls the public service sector and large industry sector can create unprecedented demand for good design and throw up challenges which many engineering designers, industrial designers,

technologists, scientists and communicators will rise to meet, and a breakthrough for healthy growth can be initiated. We have had many examples where challenges have been thrown in and have been met successfully. One is the spectacular success of C-DoT mission despite there being many detractors trying to scuttle the programme. This I think is a watershed in India's technological self reliance. Another interesting example of meeting the challenge is atomic power development programme where external assistance was not available and now there is a big expansion plan to be implemented indigenously largely because of our will and effort to achieve self reliance in this area by creating a cadre of competent designers, technologists & scientists to do this. There are many other areas and worth mentioning is the small industries sector. They neither had the clout nor the resources to seek foreign technical collaborations. They had to rely on their own talents. Most of these started with copying designs. They developed the manufacturing technologies themselves and from these developed new products. Some of these products are unique to India which no other country need to produce. These were the companies which first employed design services. Many of these have grown and become big in their own right. Some of them are now going in for fresh infusions of technology but they are better placed as far as assimilation and absorption is concerned and have capability to adapt it to suit them and their markets. It is these industries which have really taken the brunt of technological development in India.

Some big companies have taken the building up of technological capability seriously. They considered design activity as central and not peripheral, and created full fledged design and development facility right from their inception. One such company is Larsen & Toubro Ltd. in Bombay. It spends 2% of its turnover in design & development which is quite respectable by world standards in its sector. They are so successful that in some product areas they are considered world leaders. They have also exported technology and design know-how and have received 'good design' awards at Hannover fair in Germany. They also import technology and unlike many other companies they are very selective and their absorption is 100%.

Another example is TELCO (Tata Engineering & Locomotive Co. Ltd.), a big manufacturer of commercial vehicles and trucks. They started with collaboration but simultaneously developed their in-house R&D centre which is one of the largest in-house design and development facility in India. For the last three years they have been launching a new product every year and have taken the competitors having Japanese collaborations, head on. One reason is the faith they have created because of the consistent quality of their products and the other is that their products fit in very well with the Indian market conditions.

Punjab Tractors has designed and developed their range of tractors within the organisation with some help from consultants and thereby built up a design culture in their company. Eicher Tractors in Delhi is also designing new models on their own. Bajaj Auto Ltd., India's number one 2-wheeler makers are strengthening their design department with more personnel and equipment and are on the verge of bringing out new indigenously developed products in the market. Their new rear engined 3-wheeler rickshaw, an instant hit in the market was a land mark in indigenous product design and development and confirmed that given a chance, design well integrated with technology can contribute to the growth substantially.

Though design is utilised in many industries today but it is also unheard of in many more. If design utilisation is wide spread, which can happen quickly if adopted as policy and nurtured till maturity would reflect in better products, better systems, better services, better productivity, better wages and above all better life - which is the aim of any national development programme. This can be achieved quickly if there is a concerted policy on design.

Every nation has its unique problems regarding environment, population, transportation, urban expansion & growth. All these problems are linked to design in some way or the other. Developmental policies, therefore will have to be linked to the national science, technology & design policy of our nations, because the solutions to these problems lie there and not in the products & technologies from other countries.

