Product Innovation - a Cultural Lag

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Till now, we have had the privilege of manufacturing products innovated, designed and developed by others. There was West or Japan to look forward to for any new development. Our industries could conveniently introduce only such products which were found successful in the developed countries. The design transfer has been either by a collaboration from a foreign maker or by direct copying of the product, most of the time. This comfortable reliance has led us to believe that no organised infrastructure for product innovation is needed for our country. The institutional inputs for innovation as well have been so far insignificant.

But this privileged era of dependence is coming to an end. We need indigenous designs. And we need them for several reasons like 'Collaboration is not all that rosy'; our customer-needs ‘are different; production facilities and economy here are not same as in the West; we have internal competition; we need product diversification; and we have to export our products.

Collaboration is not that profitable as it is projected to be. Collaboration in the latest products have to be paid for dearly in foreign exchange. The collaboration would give away the‘ design know-how’ of only the discarded models on easy terms. We are developing fast and cannot afford to invest heavily on tooling for out-dated models. There are companies which have started with design collaborations, unable to change their age-old models as the investment on tooling has not been recovered so far. Their position would become disastrous if a competitior starts making the latest version of the same product. Collaboration also means continuous payment of royalties.

Our customer needs are different. The products we produce should suit the needs, cultural habits and the economy of our people. Products, though successful in West may not sell in the Indian market. A manufacturer making tangential fans with an imported design would not sell them as the breeze was less and cost higher than the conventional fan. A product like Vacuum Cleaner which can be seen at every home abroad is not picking up sale here. Western type toilets in our trains have been a total failure;

Our production facilities and production economy have their own limitations and advantages. Products are often copied as they are, without paving heed to production facilities or production economy here. Recently, one manufacturer of plastic goods was searching for a small-sized carbon dioxide cartridge for domestic fire extinguisher. The manufacturer in his hurry to copy a foreign design realized, after making the moulds for the body and cap, that the size of the cartridge made in India are much bigger. The “quick return" copy resulted in a substantial loss. Desk calculator casings are made by injection moulding with very high tool costs in spite of low production runs. Labour intensive processes like vacuum forming and F.R.P. moulding, which have low investment costs are not often used as the Western manufacturers do not use them. Plastic toys are replacing wooden toys though wood is plenty in the country.

We have internal competition. The days of monopoly are almost over and we have competition in many products. But several manufacturers seem to sell a product with almost the same design features. The potentiality of product design for developing a market strategy is completely overlooked by our industries. All our refrigerator companies offer almost identical refrigerators. New ideas in refrigeration which would bring down the cost of refrigerators substantially, have not been thought of so far by our manufacturers. Experimental cold- storages substantially cheaper, have been built by designers. Yet our industrialists do not care to invest in the innovation of such models. The sale of refrigerators could increase at least 10 times if a common man’s model costing l/4th of the present refrigerators, is introduced in the market. The severe competition that is taking place among the fan manufacturers is another example of lack of market-strategy based on design features.

We need product diversification to utilize unused production capacity. Unused production capacity has been used in the past to cut out competition. But with the changed political situation, it is becoming obligatory on the part of the industry to use its full capacity. Innovative product which can be made with the same production facilities can very well solve this problem. There is wide scope for introducing new products in the unexplored areas. Our manufacturers seem to refuse to enter into areas like educational aids, toys and consumer goods for rural life. The vast market in the rural areas has been paid little attention.

Exports are our main concerns today, we are unable to export our manufactured goods in the desired quantities. We cannot indefinitely keep on exporting semi-finished goods and raw materials. Export of finished products demand high quality and individuality in design. In toy industry alone, we have not tapped an estimated export potential of Rs.10 crores per year, due to lack of original design and

orgnisation. Indian products in areas like hand tools, scientific equipment and machine tools are unable to compete in the markets abroad in spite of their low cost of production. One agent with a large export orders could not find a supplier of a product like pair of scissors with a modified design. Our manufacturers are often reminded by outside agencies about the lack of design quality of their products; Often manufacturers from abroad are getting the components of their products made in this country. Even plastic injection moulding dies are getting made from the Indian makers. The only factor which is preventing us from making our own products for export seems to be absence of indigenous designs.

All these reasons assure us the need for our own designs. What is preventing us from getting our products designed and developed within the country? Certainly not the lack of brains. One reason has been fluctuating market conditions. It has been rather difficult to predict the availability of raw materials and power supply. And this instability in the raw material market has led to the absence of product planning. Even big manufacturers do not have this concept of planning for future products. The manufacturers do not know what he is going to produce in the next five years. He thinks of changing the product as and when a crisis arises. The introduction of new product, often takes place by the whims and fancies of the top management. There are hardly any scientific surveys or investigations conducted regarding the consumer needs. With the changed political situation manufacturers have no excuse not to introduce product planning

The second and the basic reason is that the culture of innovation is new to our industry. Our manufacturers; most of them with a trading background, are used to getting quick returns. Many of our manufacturers simply do not understand that design development is a lengthy and costly process. One has to invest money on innovation if one has to reap the long term benefits of patented designs. A manufacturer who does not hesitate to spend to the tune of 1lakh on a die is not willing to spend 10 per cent of the amount on the design of the product for which the die is to be made.

Further, the manufacturer is suspicious to spend on the design or innovation as he is unable to imagine the results. He often tends to think that the ideas drop down from somewhere. The various steps involved in innovation and design are yet unfamiliar to him. If we say that developing a simple product involves data collection, analysis, idea- generation, mock-up models, prototypes and trial manufacture, the top management is apt to conclude that it is all too academic and unnecessary. Let us examine one product to evaluate the need of various process cited above. A competitive product like “domestic pressure cooker” looks ideal for such study. To start with a lot of information needs to be collected such as: What

are the various pressure cookers in the market? Their sizes, shapes and costs, I.S.I. standards; How much a pressure cooker weighs; How fast it can cook; How long it lasts; How often the gaskets are replaced; What materials are used for body and handle; How are the handles fixed to the body; Is there compartments to cook varieties and so on.

Information from the users; What income- groups buy the cooker, what is the family size; what do people cook in pressure cookers; do vegetarians and non-vegetarians use the cooker differently; Is the pressure cooker also used for frying etc.; how many varieties are cooked at a time like dal, meat, rice, etc. what heat sources are used, like stove, gas, hot plate etc.; who uses the pressure cooker in the house; what height the pressure cookers is to be lifted while cooking; can the house-wife lift the cooker easily; does the housewife get scared of using a pressure cooker; is it easy to close the lid; can the inside vessels be taken out easily; and any other complaint from the user.

Information from the markets. Which brand-names are preferred, any reasons; does the customer ask for the guarantee which economic class buys the pressure cooker mostly; who influence the buying, the housewife, husband or neighbours; is the cost main consideration or any other factor; does the customer buy for his use or for presentation; are there any colour preferences; what type of advertisement is given by the makers; is the pressure cooker displayed in the show rooms; and is it exported?

Information from the manufacturer: What are the processing facilities and limitations of the maker; production rate; does the manufacturer gets part from outside; any production or assembly problems; production cost of each element; cost break-up of each element; any other relevant data?

Information on latest developments: Any latest developments in pressure cookers", latest materials for pressure cookers‘, any new ways of cooking apart from the pressure cookers; what energy sources are likely to be available in future; what are the trend in the design of stoves, hot plates and gas burners; and so on.

This enquiry would suffice with the data we require.

We now know that the pressure cooker is operated by a housewife. She has to lift up and remove it from a kerosene stove or a gas burner. Can she lift the pressure cooker with contents, easily with one handle? The maximum comfortable weight to be lifted with one handle can be found out from ergonomical studies. Do we need two handles? People cook rice and vegetable at a time in a pressure cooker.

Rice takes only 5 minutes to cook whereas potatoes take 8 minutes. Can we let off steam from rice along after 5 minutes.

It is reported that closing of pressure cooker is clumsy and difficult. Can we redesign the -gasket for easy closure. A structural analysis of the gasket would indicate, why it is difficult to close. A recent study at the industrial design centre, IIT Bombay revealed that the simple change in the profile of gasket can give a smooth closing of the lid.

Is it easy to take out inside vessels with a household pliers? If not, can we shape inside vessels for this purpose? Housewives transfer cooked rice and dal from the inside vessels into serving vessels? Is it because the inside vessels do not look fit for a dining room? Can we change the shape of inside vessels? Some people use the pressure cooker for frying,etc. after cooking. Is it convenient for such purpose? Can we make it wider? Many units are brought for presentation. Can a special presentation model be designed? How about a new package? Is the appearance of pressure cooker comparable with the other cooking utensils? Can we introduce better-shape? Can we colour the pressure cooker? So on and so forth.

Thus, we see that analysis is a process of dividing the problem into sub-elements and co-relating the variety of information to project new ideas. The analysis gives a clear picture of the problems and leads to final problem specification. At this stage the top management along with designers, engineers and sales managers will have to decide the future course of product development with -a market-strategy in mind. For example, it may be decided to develop a pressure cooker in stainless steel with the relevant technology for copper cladding at the bottom to increase efficiency. Or it may be decided to develop a two tier system to cook rice and vegetables at the same time without opening the cooker in between. Or it may be decided to introduce a presentation model without major changes in tooling.

In the first two cases the job is assigned to product innovation team consisting of development engineers and industrial designers. In the last case, which is a most common decision, industrial designers develop a new model based on the analysis. A market strategy is outlined and the idea generation stage starts.

The designer starts sketching his ideas. Creative techniques like brain-storming are employed at this stage. But each designer develops an individual style of his own with experience.

One or two concepts are selected out of the numerous ideas, for making mock-up models. The mock-up models in wood, plastics or plaster would give a 3 dimensional idea of the product. Simulation techniques are used to depict the

models excactly like that of an original. If any mechanism or handle etc. are to be tested, a test model is prepared simultaneously for testing. The models, with details, are again presented to the top management for a final decision. Production engineers and sales personnel are consulted at this stage.

Once the mock up model is accepted the prototype making is started. Development engineers and industrial designers work together to develop the prototype. As soon as the prototype is made and tested, a sizable number of trial models are prepared to get a selected consumer reaction. The tooling for manufacture takes place from this time onwards.

In our industry the top management is still unaware of the trained personnel in innovative techniques. Industries in the developed countries invariably have product innovative groups within the company or they get the consultancy services from such groups. Industrial designers who play a key-role in such innovative groups are still not to be seen in our industry.