

# DESIGN PERCEPTION IN INDUSTRY

Special project

The special project entitled -

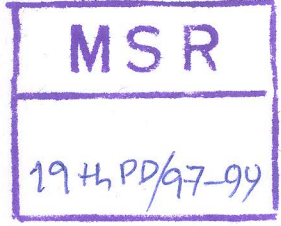
"DESIGN PERCEPTION IN INDUSTRY"

By Jayraj Patil

In approval of the project submitted in partial fulfillment of the requirements for the degree of  
Master of Design

By

JAYRAJ PATIL



Guide: Prof. K. Munshi

Examiner  
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## APPROVAL SHEET

The special project entitled – *Project: Design of a support at every stage of the project.*

**“ DESIGN PERCEPTION IN INDUSTRY ”** *of the project who have encouraged and help come for the project.*

By jayraj patil

Is approved for the partial fulfillment of the requirements of the  
Master of Design Degree in Industrial Design

JAYRAJ PATIL

Guide

:



Examiner

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### ACKNOWLEDGMENT

#### 1. Scope in the project

I am greatly indebted to my guide **Prof. K. Munshi** for his guidance and support at every stage of the project.

I also own my thanks to the IDC faculty and staff, to my batch mates who have encouraged and helped me for the project.

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JAYRAJ PATIL


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## 1. Steps in the project

DEFINE THE AIM OF THE PROJECT



LITERATURE REVIEW



MAKING OF QUESTIONNAIRE



COLLECTION OF INFORMATION



ANALYSIS OF INFORMATION



PRESENT THE FINDINGS

## 2. Aim of the project

Today, when the process of liberalization is on the way, many changes are taking place in Indian industry.

Company identities are metamorphosing, brands are revamping & business perception of design is shifting from the domain of the effete into a valid concern for even most hardheaded manager.

Within this context, this project studies a set of management- based perceptions on design & it's worth, with a view to design school & design students understanding & questioning the role of design & the links between design & management. The project also considers why, design remains under-utilized as a corporate resource; it's influence no more than skin deep & what key challenges face the sector as it matures.

1. Product identity
2. Communication
3. Environmental
4. Corporate identity

### 3. What is design?

The word design is much used. Dictionary definition lists its meaning as a plan or a scheme. The word is also used to denote the end result, particularly appearance, of a design process- as when we refer to the "Design of a car"

We can think of it as the outward appearance or physical arrangement of objects involving shapes, layouts, colors, textures, patterns and so on. Sometimes design might be thought of in terms of technology that goes into a product or its convenience in use, including ergonomic aspects. Similarly economics, as represented by purchase price or service costs, might be seen to be in some way related to design.

**Classification:**

Design can be classified in four groups:

1. Product design
2. Communication design
3. Environmental design
4. Corporate identity design

## 4. Product design

Product design lies in the destination between so- called industrial design and engineering design. The former is concerned with aspects of the product which relate to the customer or user, especially appearance and styling; the latter concentrates on the structure or function of the product and its economic manufacture. However, the skills required in the practice of industrial design frequently overlap those of engineering design and, sometimes, of other related disciplines such as ergonomics.

What includes design?

Designing may be viewed as being concerned with the preparation of appropriate solutions to marketing problems. These problems may be explicit or implicit; in either case, a key activity in designing is to review the associated symptoms or circumstances and to accurately define or redefine the problem. Then analysis, iteration and simulation are used to drive a feasible solution.

As part of such a process of designing, many activities may be involved, including generating novel concepts, reviewing and modifying existing concepts, carrying out experiments, building samples and seeking the constructive advice and judgement of others. Consequently, those engaged in this work must possess skills of creativity, analysis, synthesis and communication, plus knowledge of technical data, of existing solutions and of current and future trends in design.

## **5. Perceptions of design**

Judging by some publications and discussions, there seems to be a degree of confusion about this even amongst designers themselves. Definitions of designing, such as the following selection indicate a wide range of perceptions:

1. A goal directed problem-solving activity.
2. Relating product with situation to give satisfaction.
3. The imaginative jump from present facts to future possibilities.
4. The conditioning factors for those parts of the product, which come into contact with people.

### **Difference in the perceptions of design**

The different reasons put forward for the difference in the perception of design is,

1. Managers typically experience great difficulty and unease when making judgements about what may be good or bad, appropriate or inappropriate design because their skills tend to be derived from analytical disciplines. In particular, they may not be able to evaluate critically the results of design projects.
2. For managers who have come to terms with it, design is a resource, which can add value to products and services. If used properly, just like money spent wisely on advertising or the streamlining of manufacturing system, an investment in design can produce good returns and contribute to improving the profitability of a business. In

- contrast, designers may stress other priorities in their work and may resist attempts to measure the results of their efforts in financial and strategic terms.
3. Conservation's with designers often reveal wider concerns such as desires to improve the environment, to elevate public taste in art and design. While managers might sympathize to a greater or lesser degree with these aims, their main interest in design is almost invariably with what might be termed 'DESIGN FOR PROFIT'. In turn, this raises differences about what is good or bad design.
  4. In business terms, good design can often be defined simply as that which sells well; but sometimes designers are critical of popular design and instead champion design results, which, to the uninformed eye, may seem esoteric and impractical.

## 6.1 The new age of new product development

This article presents the result of the study about product design and new product development management issues in companies with advanced technology products. The study uses a DELPHI questionnaire methodology to identify and evaluate the importance of these issues. The most important issues are discussed in relation to 'new paradigm' of successful NDP. Attention is given to similarities and differences between the study results for USA and for Europe. Three questionnaires were used. The first evaluated the importance of fifty- five issues. The second, distributed to participants of first and more widely, included the top- ranked issues from the first as well as new issues identified by participants in the first questionnaire. Third questionnaire further windowed the issues and included additional participants provided comments. The final importance rankings of the study are based on results of the third questionnaire.

The top priority problems:

### **Strategic planning for technology products-**

Issues associated with strategic and long- range planning for technology- product development, such as aligning high- tech strategies with business strategies, new product introduction strategies, lack of understanding of technology and its roles among corporate strategic planners, failure to identify the critical success factors of a company's technology activities, and establishing the corporation's technology climate.

Coordinating

### **New product project selection-**

Issues involved with high- tech new product development project selection, e.g., the criteria, how to establish a systematic approach to selection, inability of conventional financial analysis criteria to evaluate the potential of radical new technology.

### **Organizational learning about technology-**

Issues related to organizational learning and institutional memory about new technology and new product development, including how to conduct training, how to provide updating educational opportunities for technical personnel, how to accelerate organizational learning, how to accumulate organizational learning and how to develop education and training programs for special needs such as for design for manufacture.

### **Cycle time reduction-**

Issues about accelerating new product development cycles; e.g., limitations of cycle speed benchmarks, making concurrent engineering work, the virtue of using cycle speed to permit a later start on product development rather than to introduce new products sooner.

### **Creating a conducive culture-**

Issues having to do with creating a corporate culture conducive to high tech new product development; e.g., establishing an internal sharing and informal networking culture, reducing within company rivalries, gaining full cooperation of all groups in the company, giving recognition to the importance to the company of new product development.

Coordination and management of new product development teams-

Issues surrounding new product development team structure, team sizes, membership composition of teams, team operations, team management, team control and evaluation, team motivation.

**Involvement of marketing groups-**

Issues about the involvement of marketing, market research and customer service personnel in new product development, such as their participation in selecting research and product development projects, identifying customer needs, defining the market timing the introduction of new higher- tech products that will make the company's existing product absolute, establishing the high- tech product family mix, and accelerating feedback from the marketplace about customer satisfaction with the newest high-tech products.

**Customer/ supplier involvement-**

Issues about weather and how to involve customers and supplier in new product development; e.g., how can collaborating vendors be prevented from passing customers in which suppliers should develop prototypes for the company or should be restricted to contractual arrangement based on technical specifications, and need to help suppliers upgrade their capabilities so they can better assist the company.

Two significant conclusions are reached:

1. NDP experts are in complete agreement about the primacy of the strategic planning for technology product issue.

2. NDP experts are in substantial disagreement with respect to the relative importance of six of the issues. Beyond the specific related to each of these difference, this finding engenders a concern that NPD research studies.

Foremost among these is that R & D managers and senior managers should work together to deal with a company's possible need for improved technology strategic planning.

Development

This article examines the level of development flexibility in the R & D process, how it enhances performance, and how it can be improved through organizational

Development flexibility

Development flexibility can be described as a state of mind that allows R & D managers to respond to changes in the market as a process of developing new products. It is a state of mind that allows R & D managers to respond to changes in the market as a process of developing new products.

The article examines the level of development flexibility in the R & D process, how it enhances performance, and how it can be improved through organizational

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A Development flexibility can be described as a state of mind that allows R & D managers to respond to changes in the market as a process of developing new products.

Source: Antonio J. Bailetti & Sean Mccluskey, *R & D Management* 28, 4, 1998, page237

Development

## 6.2 Agile product development

Many companies appreciate the importance of agility in executing business processes.

While academic research has established a linkage between flexibility and firm competitiveness, thus far it has focused primarily on manufacturing and strategic flexibility.

But another business process has a clear and compelling need for flexibility as well: product development.

This article examines what development flexibility is, how it can be quantified, how it enhances performance, and how it can be introduced into an organization.

### **Development flexibility**

Development flexibility can be expressed as a function of the incremental economic cost of modifying a product as a response to changes that are external or internal to the development process. The higher the economic cost of modifying a product, the lower the development flexibility.

The economic cost of modifying a product arises from a change impact on four factors: the products' development expense, its unit cost, its performance, and the development schedule. Changes in each of these factors can in turn be quantified and expressed in terms of cumulative profit impact.

A project can be considered flexible if the economic cost of a change is low in relation to the change in the perturbing variables. Projects in which this economic cost is high can be viewed as inflexible.

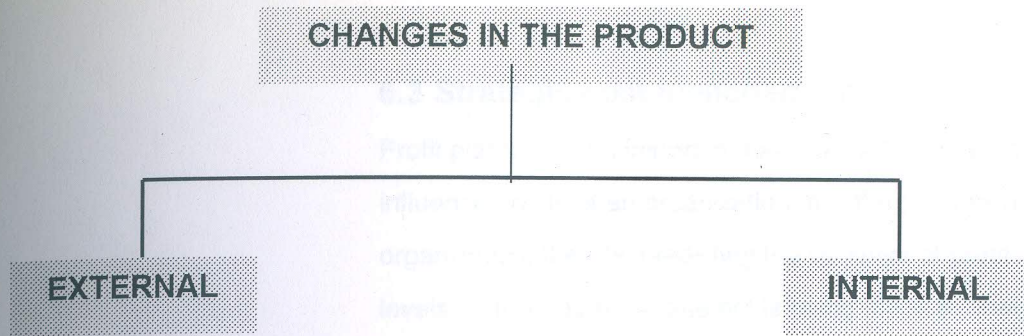
### **Unstable customer needs & design**

Product requirements are unstable is a fact known to practitioners and well documented. In many areas of product development, the increasing speed of technology development and its related technological obsolescence have further increased the instability of component requirements.

Academic research in the area of technological innovation has shown that significant part of these changes can be attributed to:

- The co-evolution of technical solution in components that are part of a large system;
- Customers' inherent difficulty in accurately specifying their needs at the outset of a design project system.

As designers at the system and subsystem level engage in problem solving, they can alter interfaces within the system. Since these interfaces are in reality the product requirements for subsystems, these subsystems in turn are subject to changing requirements.



**Cost of modifying a product**



Source: Stefan Thomke & Donald Reinertsen, *California Management Review*, Vol. 41, No. 1 1998, page 8

### 6.3 Strategic cost management

Profit planning is an important tool available to management accountants to plan and influence profits of an organization. It is the process of understanding the cost structure of an organization, thereby predicting the behavior of profits over a range of relevant volume levels. In this paper, an attempt is being made to analyze the relevance of this profit planning and means of improving it to a strategic level.

#### **Product design**

A product design which is very simple, contains only a few components reduce the cost of assembling, the cost of maintaining enormous inventories and cost of maintenance. This is one of the critical factors, which determined the success.

Target costing is a technique, which could be used to harness the linkages with suppliers to achieve competitive advantage. Under this method for a given customer value the target selling price is determined. Designers work in close coordination to produce the product with in the target cost.

This technique tries to identify all costs incurred on a product from conception stage to ultimate abandonment. It traces the cost of research, design, engineering, prototype, final product, maintenance costs and abandonment costs. Life cycle costing can help to design product to reduce post-purchase costs of the customer and this can be major weapon in achieving competitive advantages.

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Source: *Strategic cost management, Indian Management, May 98, page 33*

## 6.4 Design & manufacturing

Many companies have come to appreciate the disadvantages of the approach to product development. Final designs emerging from engineering may be producible only at very high cost. Forcing manufacturing to wait to begin its work until a design is released prolongs the development time of a product and may force a company to miss a market opportunity. Often a company is forced to play catch-up by implementing numerous engineering changes long after products have been introduced.

Fundamental to all of the approaches is basic change in structure of the organization.

- **Manufacturing sign-off:**

In this approach, manufacturing engineers are given veto power over product designs, which cannot be released without manufacturing's approval, though in some cases, only its final approval. It is unlikely with this approach that an unproducible or barely producible design will reach the factory floor. But the approach's drawback is it gives a club to manufacturing without providing for creative interchange between the two functions and does not allow manufacturing to begin its work until designer's work is complete.

- **The integrator:**

Integrators work with designers on producibility issues, serving as liaisons to the manufacturing group. Naturally, such a role requires individuals who can keep design and manufacturing perspectives in balance. An integrator who leans too heavily toward

manufacturing will lose credibility within designers, and someone who leans too heavily toward design will simply not get the job done.

- **Cross- functional teams:**

Another step away from the traditional approach is cross-functional teams. At a minimum these consist of a designer and a manufacturing engineer, who work together throughout the whole process. The team meets regularly or may even be located in the same office.

This is the first approach that facilitates simultaneous engineering: the manufacturing engineer becomes familiar with the design well before it is released and may even have had a hand in creating it.

**The product process design department:**

It entails creating a single department responsible for both product and process.

A senior manager with responsibility for both product and process design, but separate submits for each function.

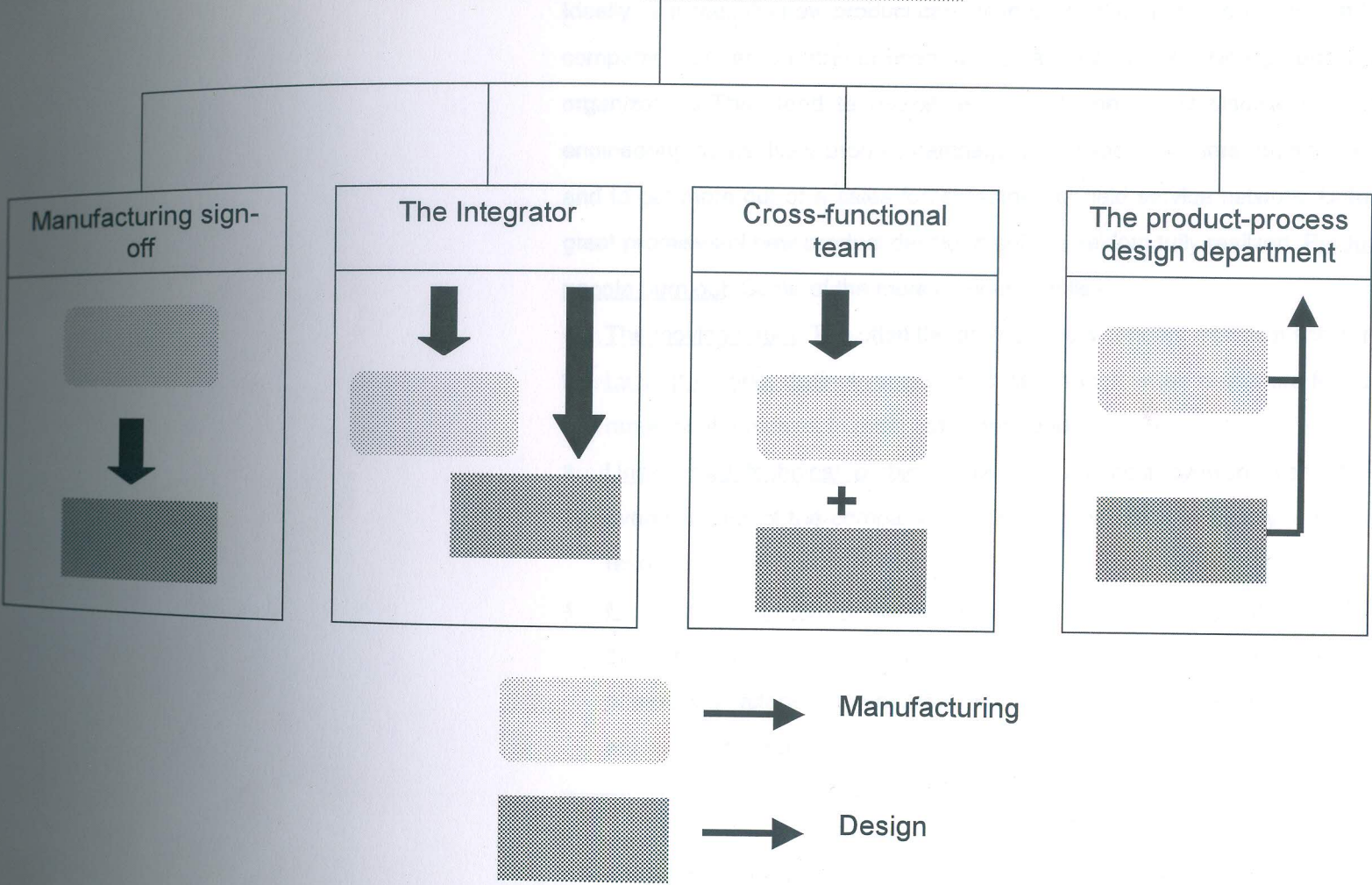
Product and process engineers combine into a single department with one manager having responsibility for both groups.

One department composed of product-process engineers, that is, individuals with responsibility for both aspects of the design, a rarely found ideal, since very few people have the skills necessary to straddle both worlds.

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*Source: James W. Dean & Jr. And Gerald I. Susman, Harvard Business Review, Jan 1989, page 28*

# Structure of organization



Source: James W. Dean & Jr. And Gerald I. Susman, *Harvard Business Review*, Jan 1989, page 28

## 6.5 The new product development map

Ideally, a successful new product can set industry standards-standards that become another company's barrier to entry- or open up crucial new markets. New products are good for the organization. They tend to exploit as yet untapped R&D discoveries and revitalize the engineering corps. New product campaigns offer top managers opportunities to reorganize and to get more out of a sales force, factory, or field service network. Unfortunately, these great promises of new product development are seldom fully realized. Products half make it; people burn out. Some of the more obvious pitfalls -

1. The moving target. Too often the basic product concept misses a shifting market.
2. Lack of product distinctiveness: This risk is high when designers fail to consider a full range of alternatives to meet customer needs.
3. Unexpected technical problems: Delays and cost overruns can often be traced to overestimates of the company's technical capabilities or simply to its lack of depth and resources.
4. Mismatches between functions: Often one part of the organization will have unrealistic or even impossible expectations of another. Engineering may design a product that the company's factories cannot produce, for example, or at least not consistently at low cost and with high quality.

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*Source: Steven C. Wheelwright & W. Earl Sasser, Jr., Harvard Business Review, May 1989, page- 113*

## 6.6 Manufacturing by design

In many large companies design has become a bureaucratic tangle, a process confounded by fragmentation, overspecialization, power struggles, and delays. Direct labor, even lower cost labor, accounts for so little of the total picture that companies still focusing on this factor are misleading themselves not only about improving products but also about how foreign competitors have gained so much advantage.

In short, design is a strategic activity, whether by intention or by default. It influences flexibility of sales strategies, speed of field repair, and efficiency of manufacturing. It may well be responsible for the company's future viability.

### Design team

Multifunctional teams are currently the most effective way known to cut through barriers to good design.

A design team's charter should be broad. Its chief functions include:

1. Determining the character of the product, to see what it is and thus what design and production methods are appropriate.
2. Subjecting the product to a product function analysis, so that all design decision can be made with full knowledge of how the item is supported to work and all team members understand it well enough to contribute optimally.
3. Carrying out a design- for- producibility- and- usability study to determine if these factors can be improved without impairing functioning.

4. Designing an assembly process appropriate to the product's particular character. This involves creating a suitable assembly sequence, identifying subassemblies, integrating quality control, and designing each part so that its quality is compatible with the assembly method.

5. Designing a factory system that fully involves workers in the production strategy, operates on minimal inventory, and is integrated with vendors methods and capabilities.

Strategic product design is a total approach to doing business. It can mean changes in the pace of design, the identity of the participants, and the sequence of decision. It forces managers, designers, and engineers to cross old organizational boundaries, and it reverses some old power relationships.

It is a continual process, so it makes sense to keep design teams in place until well after product launching when the same team can tackle a new project.

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Source: Daniel E. Whitney, *Harvard Business Review*, July 1988, page 83

## **6.7 Coordination at different stages of the product design process**

This article addresses the question: how does the coordination challenge faced by managers change over the life of time bound project such as product design. It uses coordination structure, an approach to modeling organizational situations that highlights concurrent responsibility interdependencies rather than the more traditional task interdependencies. It explains coordination structure and uses it to capture the responsibility interdependencies in a sample of complex system design projects drawn from two different organizations.

New product development is increasingly the key to competitive advantage in a wide variety of industries. Coordination underlies many of the management problems in designing products rapidly and effectively. The focus of the article is on time varying interdependencies typical in product design organizations.

### **Coordination structure**

Product development commonly involves numerous interdependencies among individuals and group in an environment of high task uncertainty. It is useful to think of such interdependencies as existing at two levels: task interdependence and responsibility interdependence. When an organization carries out work for which the necessary tasks are well understood and stable, task is a useful perspective. This would be the case in most building construction.

A coordination structure is a configuration of actors who have interdependent responsibilities to create, modify and use an array of shared work objects. In the product design domain, typical shared work objects would be customer requirements, designs and test results. Associations between an actor and a set of shared work objects specify the actor's responsibilities. The responsibilities of actors are interdependent if the actors have associations with one or more of the same shared work objects.

### **Data collection**

Data were collected from eight system development projects from two companies. Company A, an integrated telecommunications equipment manufacturer, produces standard designs to be manufactured and sold to a variety of customers. Company B, a weapons system R & D organization, produces custom designs for individual customers. Each interview followed the same protocol and identified the relevant actors, shared work objects and associations between actors and shared work objects active in the project at the time.

### **Data analysis**

Table prepared from data includes comprehensiveness, conceitedness and complexity measures. Comprehensiveness and complexity capture the overall size of the challenge faced by the project manager. Conceitedness captures how tightly interrelated are the project elements that must be coordinated.

A striking similarity in the in the coordination structure for both companies was that system design was not used as a shared work object for projects advanced in the development

cycle. DESIGN TEAMS were using product specification to guide the design process rather than system design.

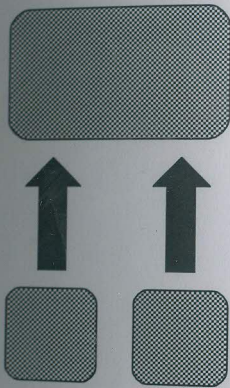
Similarly, MANUFACTURING played a minor role in the data for both companies. Manufacturing was perceived as a relevant actor only by the design manager of project. The results of analysis support the notion that the coordination challenge facing the design manager changes over the life of a project, reaching a maximum for the design manager at the midpoint of development. This study provides a way to examine how the coordination challenge facing manager changes during the life of time bound projects such as product design.

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Source: George M. Scott, R & D Management 28, 4, 1998, page 225

# INTERDEPENDENCE

POOLED



SEQUENTIAL



RECIPROCAL



→ UNIT

Source: Antonio J. Bailetti & Sean Mccluskey, R & D Management 28, 4, 1998, page237

## **6.8 Global new product development processes**

This study examines the process and routines firms employ for developing new global products. Observations from 13 Japanese, American and European multinational companies reveal that global new product development process vary in terms of the involvement of overseas subsidiaries in project teams and generation of new product concepts. Anchoring these findings on information processing theory, study develops a set of research propositions on global new product development processes and suggest directions for future research.

### **Data collection and analysis**

Data collected through personal interviews with members of global product development teams at the case sites, and typically lasted 2-3 hours. To reduce the risk of informant bias, interviews were conducted with more than one team member in most of the sites. The interviews were semi- structured and employed open- ended questions. Study probed for information on following themes:

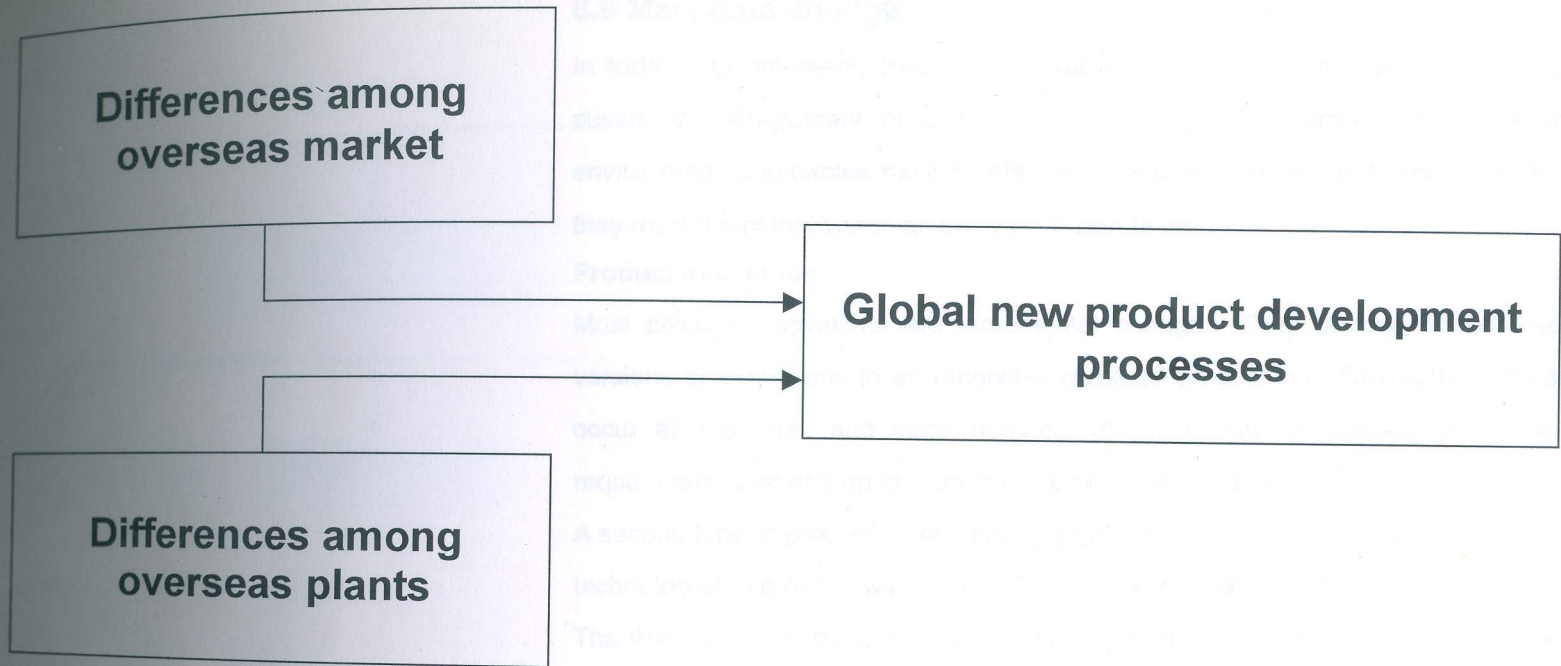
1. What were the differences in country market requirements for the concerned global products?
2. What differences did the manufacturers choose to cater to in their global product design?
3. How were global new product development projects organized?
4. What role did subsidiaries have in these projects?

Study found global new product development process to vary with respect to two attributes: team composition and sources of new product concepts. The key factors influencing their variation were the differences among overseas markets for which the global products were being designed, and the differences among overseas plants where the MNCs intended to manufacture these products.

Study examined the processes and routines firm employ for global new product development and found them to include cross-national teams and involve overseas subsidiaries as sources of new product concepts. Firms were more likely to employ cross-national teams, and include overseas subsidiaries as sources of new product concepts, when they addressed tacit differences among overseas markets and plants for their global product design.

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Source: Subramaniam, Kenneth J. Hatten, *Journal of Management Studies*, Nov. 1998



Framework for global new product development process

Source: Subramaniam, Kenneth J. Hatten, *Journal of Management Studies*, Nov. 1998

## 6.9 Managing change

In today's environment, there is no executive task more vital and demanding than the sustained management of innovation and change. To compete in this ever-changing environment, companies must create new products, services and processes; to dominate, they must adopt innovation as away of corporate life.

### Product innovation

Most product innovations are incremental changes. They provide added features, new versions or extensions to an otherwise standard product line. Obviously, such innovations occur all the time, and large numbers of incremental innovation related to customer requirements can add up to significant competitive advantages.

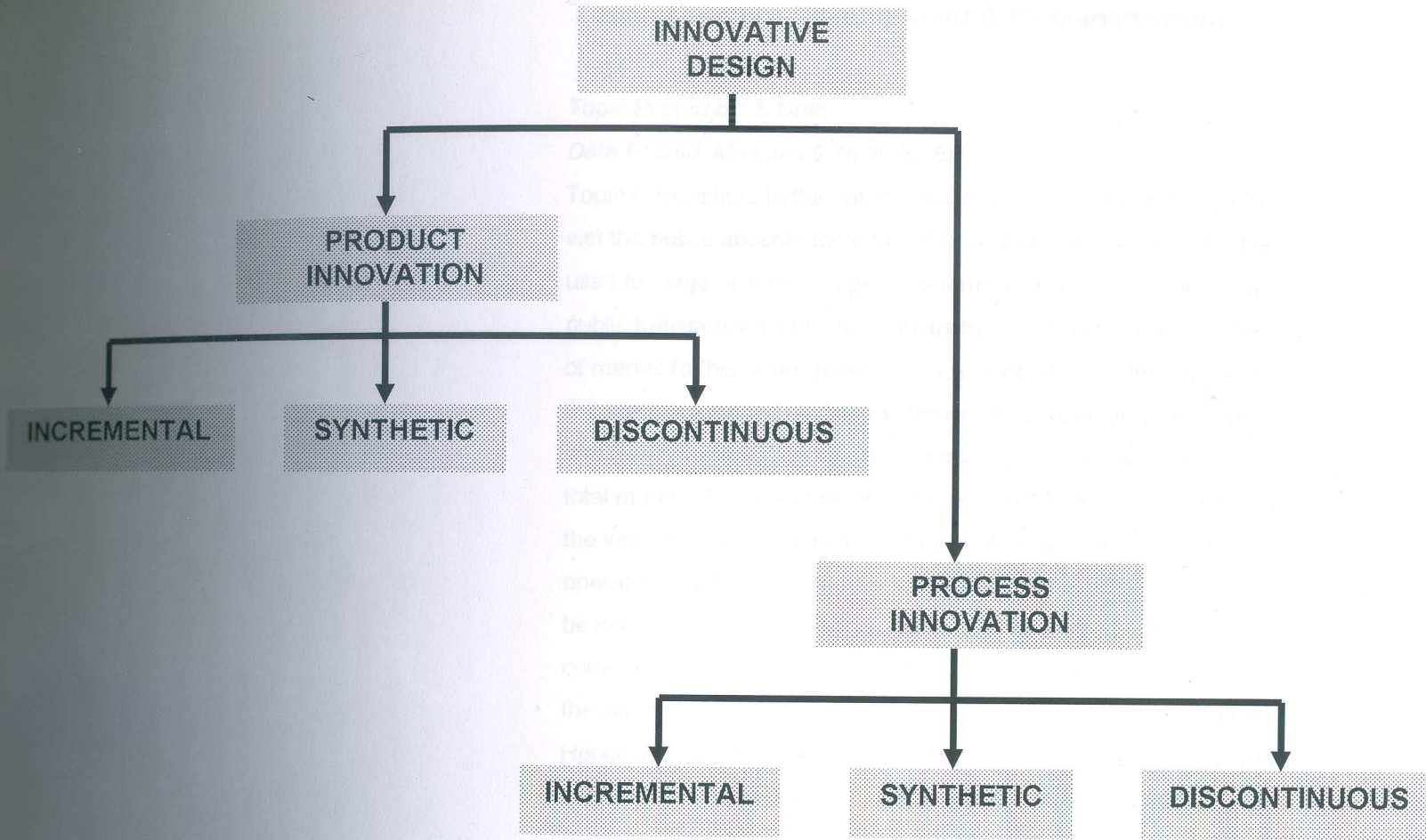
A second type of product innovation, synthetic, involves the combination of existing ideas or technologies in creative ways to create significantly new products.

The third category, discontinuous product innovations, is the development or application of significant new technologies or ideas.

As innovation moves from incremental to discontinuous, there are higher risk and greater uncertainty. It becomes increasingly important for organizations to function as effective learning system, benefiting from both failure and success.

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Source: Saurabh Sharma & Vibhas Muthu, *Indian Management*, Feb.1998, page 73



### MANAGING CHANGE

Source: Sourball Sharma & Vibhas Muthu, *Indian Management*, Feb. 1998, page 73

## **Topic: Concept Development & Its Management**

*Topic Posted by: S.Cran*

*Date Posted: Mon Jun 9 16:30:55 EDT 1997*

Topic Description: In the car industry concept projects are used to wet the public appetite for the models of 2 or 3 years. They are also used to judge opinion and perhaps form opinion. In the market for public transport vehicles the manufacturer has no control over the size of market for his or her product. this is dependant on the market for the service provided by their customer, the service provider. They can however affect market share, how many orders they get from a total market. This could be done by wetting the end user' appetite for the vehicle showing them 'how' they could travel provided that their operator bought the correct vehicle. The idea I have is that this can be done using demonstration vehicles in a structured manner to effect competitive advantage. However the manner in which this is done or the way that it might be structured is the focus for my investigation. Hence the need to draw parallels. The obvious one is the automotive industry. I do however needs more information on how they do this. Another aspect is how they manufacturer can turn seemingly obscure comment on the part of the end user into a functional design spec.

*Forum: Forum for General Discussion of Design, Management Issues.*

## Experience-Based Design: Toward a Science of Artful

### 6.1 Business Innovation

By John Cain, Founder and Principal, E-Lab LLC

Tales of great products and services inspired by an intuitive hunch abound. But the idiosyncrasies of that approach can't consistently ensure high quality. John Cain argues that a four-step, experienced-based design process yields the best results. It is one in which researchers first "frame" in a particular cultural context the experiences people seek and then test what is being designed to make sure it fulfils those needs and desires, as well as reflects a corporation's strengths and talents.

*Source: Design Management Journal, Vol. 9, No. 4, fall 1998*

## 6.10 Management based perceptions on design

After studying the different articles related to design, I found:

1. Design must be seen in context:

Design exists in a social, economic context which establishes constraints, perceptions and conditions for growth. To survive, design must meet the needs and challenges of the context. For example, definition of design for project manager will be different than definition of design for manufacturing people.

2. Design must add value to be of worth:

There is no reason why anyone should invest inducing unless the perceived returns of that investment are believed to exceed the cost. Design is not only art.

3. Design is award of different meanings:

Most designers take it for granted that the term 'design' is understood. In practice it is loosely to cover a breadth of meaning and activities, thereby providing scope of confusion. For e.g., in identifying the type of designer required, since many areas of design (aviation, textile, architecture, furniture) are covered by one term.

4. Design are not only designers:

In most of the organizations, design is team based activity. For example, the successful design and development of a new product is likely to involve a whole range of cross-

functional business activities and personnel, from marketing to finance, production to sales and design to distribution.

5. Design requires non- design work:

The successful application of design is likely to require an appropriate mix of supporting factors. The best results may be expected when there is congruence, or fit, between the needs of design and supporting factors which may include management style and leadership; skills; structure and strategies.

## 7. Questionnaire

A questionnaire consists of set of questions presented to respondents for their answers. Because of its flexibility, the questionnaire is far the most common instrument used to collect data.

Questions can be distinguished between open-end and close-end questions.

**Closed- end** questions perspicuity all the possible answers and respondents make a choice among them. Closed-end questions provide answers that are easier to interpret and tabulate.

**Open- end** questions allow respondents to answer in their own words. Open- end questions often reveal more because they do not constrain respondent's answers.

### 7.1 Types of questionnaires:

**Administered:** In administered questionnaires interviewers are responsible for asking questions and observing behavior, noting responses or behavior and explaining questions to respondents.

Advantage of this type of questionnaire is control and interviewer probing.

**Self-administered:** In self-administered questionnaires, respondents read the questions and write their own answers. Advantage of this type of questionnaire is privacy and limited interviewer bias.

## **7.2 Techniques for collecting data**

### **Survey:**

For determination of consumer's attitude and motivations, evaluation of commercials, measurement of purchase intentions, relation of consumer characteristics to attitudes.

### **Observation:**

Examination under natural conditions, interest in behavior not attitudes.

## **7.3 Issues for the questionnaire**

### **1. Issues about product development-**

- Strategic planning for technology- product development.
- Long range planning of products.
- Deciding new product introduction strategies.
- Selecting product development projects.
- Product designers learning about design.
- Taking decision on product development cycle.
- Creating a conducive culture in design family.
- Developing teams and team structure for new products.
- Market research in new product development.
- Decisions on product family- mix.
- Getting feedback from market place.
- Involving customers and suppliers in new product development.
- Finding out different problems in designing new product developments.

## **2. Issues about interdependencies-**

- Finding overlapping areas between design and manufacturing/ marketing/top management.
- Finding structures of manufacturing & design interdependencies and their advantages/disadvantages.
- Task/responsibility based interdependencies in product design.
- Finding how time factor affects in responsibilities of designer.
- Difference in design activities and considerations of designing global product when compared with domestic product.
- Non design work done by designers.

## **3. Issues about strategic cost management-**

- Importance given by designers to cost factor in product design.
- Reactions of design department on target costing.
- Finding out co-ordination of designers to produce product with target cost.
- To identify costs incurred on product from concept to ultimate abandonment stage.
- Awareness about development flexibility.
- Finding out problems in product design due to unstable customer needs.

#### **4. Issues about manufacturing by design-**

- Interference and effect of bureaucratic triangle in design activity.
- Structures and functions of design teams.
- Awareness of designers about product image.
- Awareness of designers about company image.

#### **5. Issues about design-**

- Importance of design in industry.
- Importance of product design in design.
- Importance given to different aspects of product design.
- Design by imitation/innovation.
- Methodology adopted in design process.

# QUESTIONNAIRE

1. For your company, -----

Y

N

• Design is a goal directed problem solving.

• Imaginative jump from present to future possibilities

• Product innovation is part of design

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation:

products:

Following activities are part of design:

Market research to find customer needs

Y

N

Strategic decisions of product design

Selection of project for product development

Manufacturing process design

Product cycle time decisions

Deciding product image/brand image

Deciding co-ordinating structure

Test marketing

Total design	Technical Aspects	Humanistic Aspects
100	<input type="checkbox"/>	<input type="checkbox"/>

Technical Aspects	Manufacturing	Technical efficiency (PRODUCT)
100	<input type="checkbox"/>	<input type="checkbox"/>

Humanistic Aspects	Aesthetics	Ergonomics
100	<input type="checkbox"/>	<input type="checkbox"/>

3. Non design work required.....E.g. Leadership-----

4. Do you use target costing. Y / N.-----

5. Why?-----

6. Overlapping areas ( Design & Manufacturing/ Marketing)-----

7. Relation between design and manufacturing.

Manufacturing domination/Integration/Cross function/Product-Process/-----

8. Problems facing in developing new products.

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/-----

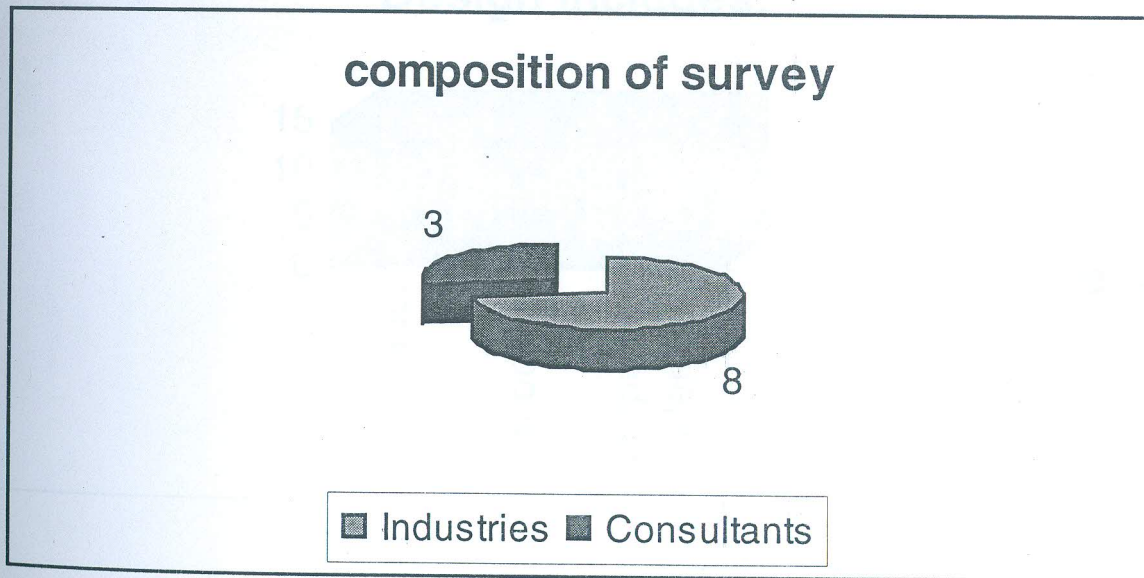
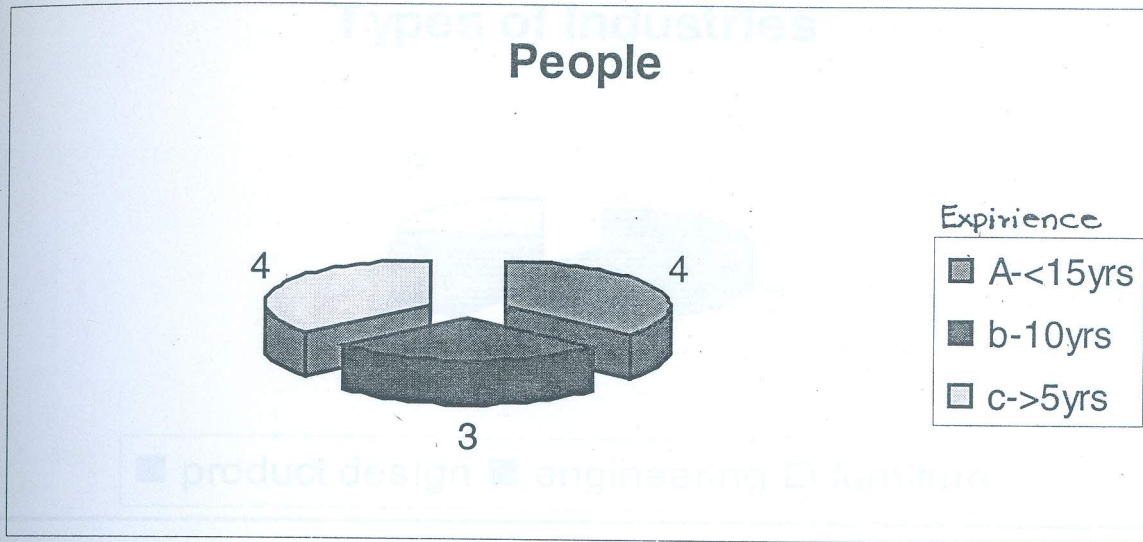
9. Final authority finalising design-----

10. Decision takers (Other than design dept.) in finalising design-----

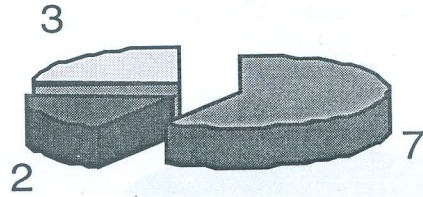
11. Global products Y / N.

12. Difference in design activities. Global/Domestic.

# 8 Analysis

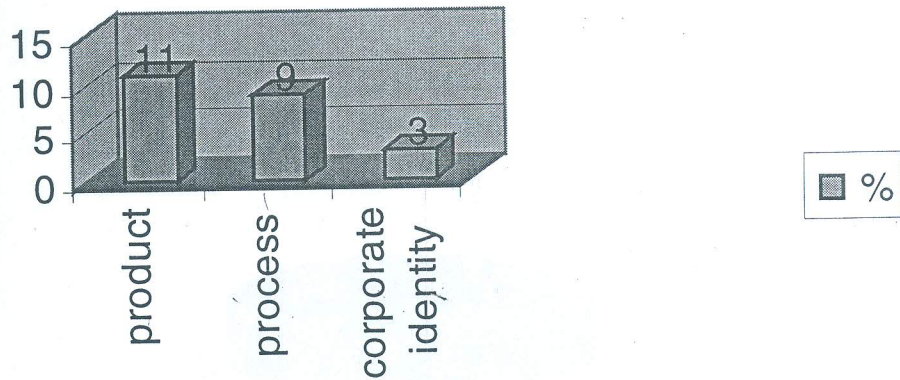


## Types of industries



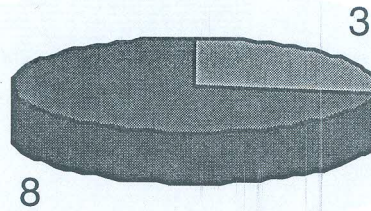
■ product design ■ engineering □ furniture

## Design includes:



## Market research is a part of design

■ yes ■ no



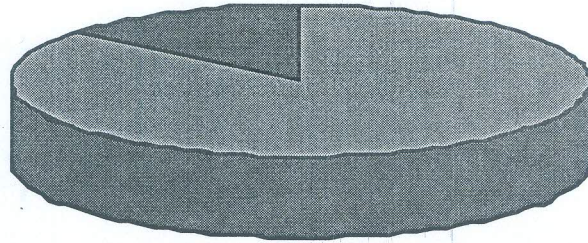
## Design includes strategic decision about products

■ yes ■ no



## Design includes manufacturing process design

■ yes ■ no



## Product cycle time decisions

■ yes ■ no



## product image/ brand image decisions

■ yes ■ no

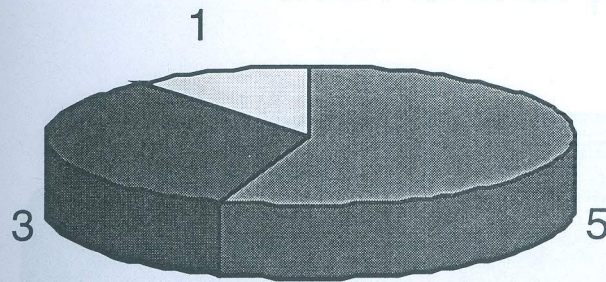


## Test marketing is a part of design

■ yes ■ no

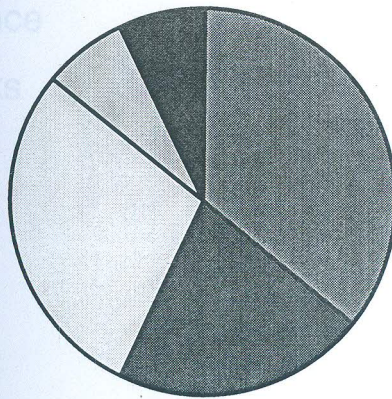


## New product development problems



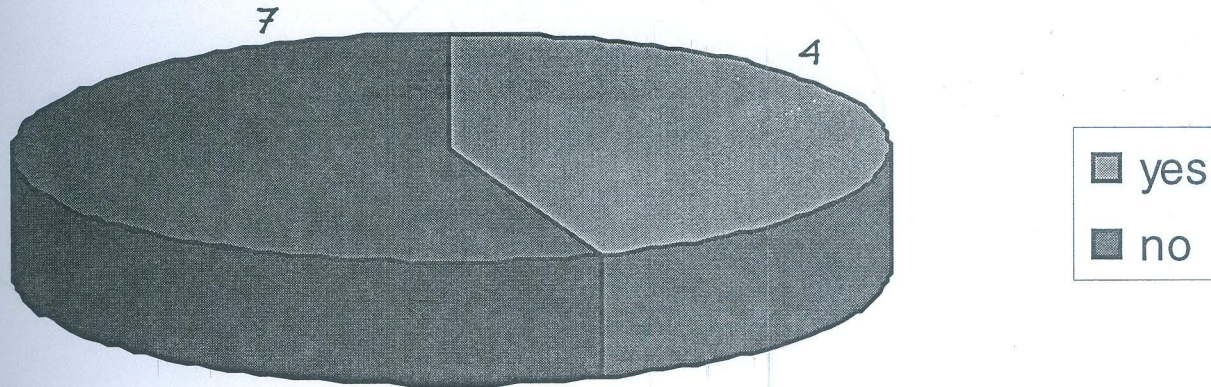
- Moving target
- Unexpected problems
- Product distinctiveness

## Non design work



- Leadership
- Business development
- Market research
- Value engg.
- TQM

## Design for global products is different than Indian products



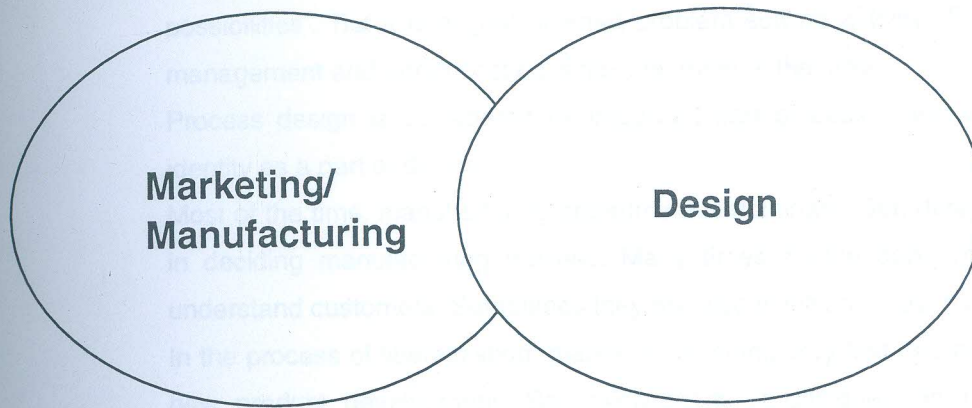
### YES

- Price difference
- Different looks

### NO

- Less inventory
- Same market

## Overlapping areas



- Test marketing
- Understanding customers
- Look of product
- Purchase

## 9 Conclusion

As far as Indian industry is concerned, design is not the “imaginative jump from present facts to future possibilities”. But it is a goal directed problem solving activity. Target is always decided by the top level management and target costing is flexible, most of the time.

Process design is considered as important part of design and very few companies considers corporate identity as a part of design.

Most of the time, manufacturing department is dominant. But, designers are always encouraged to take part in deciding manufacturing process. Many times design department carries their own market survey to understand customers. Sometimes they are also involved in test marketing.

In the process of liberalization, market is changing very fast and moving target is the main problem faced in new product development. So, involvement of designers in market research carries weightage and importance.

## 11.Organizations to be visited/ Persons Interview:

### INDUSTRIES

- **Dr.Mitra**  
*R&D Motor Division ,Crompton Greaves*
- **Mr.Barve**  
*R&D Motor Division ,Crompton Greaves*
- **Mr.C.Ramacandran**  
*Industrial Design, Crompton Greaves*
- **Mr.Sameer Damle**  
*Industrial Design, Godrej*
- **Mr.Vinod Hingo Rani**  
*Industrial Design, Onida*
- **Mr.Rajesh Shelke**  
*Industrial Design, Bajaj Electricals*
- **Mr.Sandeep Thombre**  
*Industrial Design, Bajaj Electricals*
- **Mr.Parag Trivedi**  
*Industrial Design, Bajaj Electricals*
- **Mr.Jawad Khan**  
*Bajaj Auto*

### CONSULTANTS

- **Mr.Sunil Patel**  
*Indesign Design Consultants*
- **Mr Vinayak Nabar**  
*Sigma Design Consultants*
- **Mr.Yogish Dandakar**  
*Industrial Design,Ratan Batolibai*

QUESTIONNAIRE : DESIGN PERCEPTION IN INDUSTRY

1. For your company, Sigma designs

Y

N

• Design goals are set by marketing/-----

• Futuristic product design is part of design activities. e.g.....

• Redesign is a part of design activities.

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation:

Nabar.

products:

Consultancy, Electronic products, Architecture, Furniture

Following activities are part of design:

Market research to find customer needs

Y

N

Strategic decisions of product design

Selection of project for product development

Manufacturing process design

Product cycle time decisions

Deciding product image/brand image

Deciding co-ordinating structure

Test marketing

3. Non design work required.....E.g. Leadership, ~~yes only~~

4. Do you use target costing. Y/N.

5. Overlapping areas ( Design & Manufacturing/ Marketing)-----

6. Relation between design and manufacturing.

Manufacturing  domination/Integration/Cross function/Product-Process/-----

Problems facing in developing new products.

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/-----

Final authority finalising design-----

Decision takers (Other than design dept.) in finalising design-----

7. Global products Y/N.

Difference in design activities. Global/Domestic. yes.

QUESTIONNAIRE : DESIGN PERCEPTION IN INDUSTRY

1. For your company, Godrej

Y                      N

• Design goals are set by marketing/-----

• Futuristic product design is part of design activities. e.g.....

• Redesign is a part of design activities.

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation: Sameer Dantle.

products: I. Designer

Following activities are part of design:

Market research to find customer needs

Y

N



Strategic decisions of product design



Selection of project for product development



Manufacturing process design



Product cycle time decisions



Deciding product image/brand image



Deciding co-ordinating structure



Test marketing



2.

Total design	Technical Aspects	Humanistic Aspects
100	80	20

3. Non design work required.....E.g. Leadership Quality management, leadership, cost cutting

4. Do you use target costing. Y/N.

5. Overlapping areas ( Design & Manufacturing/ Marketing) customer feedback, Quality management

6. Relation between design and manufacturing. Manufacturing domination/Integration/Cross function/Product-Process/

Problems facing in developing new products. Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/

Final authority finalising design Marketing

Decision takers (Other than design dept.) in finalising design Marketing

7. Global products Y/N.

Difference in design activities. Global/Domestic.

QUESTIONNAIRE : DESIGN PERCEPTION IN INDUSTRY

1. For your company,-----

Y

N

• Design goals are set by marketing/-----

• Futuristic product design is part of design activities. e.g.....

• Redesign is a part of design activities.

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation: Dr. Mitra , (Computer)

products: motors.

Following activities are part of design:

Market research to find customer needs

Y

N



Strategic decisions of product design



Selection of project for product development



Manufacturing process design

partly



Product cycle time decisions



Deciding product image/brand image



Deciding co-ordinating structure



Test marketing



2.

Total design	Technical Aspects	Humanistic Aspects
100	70	30

3. Non design work required.....E.g. Leadership----- Design development training, TQM, EPM, S.P.C.

4. Do you use target costing. Y/N.

5. Overlapping areas ( Design & Manufacturing/ Marketing)----- ALL

6. Relation between design and manufacturing.

Manufacturing domination/Integration/Cross function/Product-Process/-----

Problems facing in developing new products.

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/-----

Final authority finalising design----- we

Decision takers (Other than design dept.) in finalising design----- we

7. Global products Y/N.

Difference in design activities. Global/Domestic.

QUESTIONNAIRE

1. For your company, Cosmopolitan - greaves.

Y

N

• Design is a goal directed problem solving.



• Imaginative jump from present to future possibilities



Time limit proposal.

• Product innovation is part of design



• Design includes:

Product design



Process design



Corporate identity design



Person & Designation K. Ramakrishnan, product development Manager.

products

Fans, Domestic appliances.

Following activities are part of design:

Market research to find customer needs

Y

N

Strategic decisions of product design

Selection of project for product development

Manufacturing process design

Product cycle time decisions

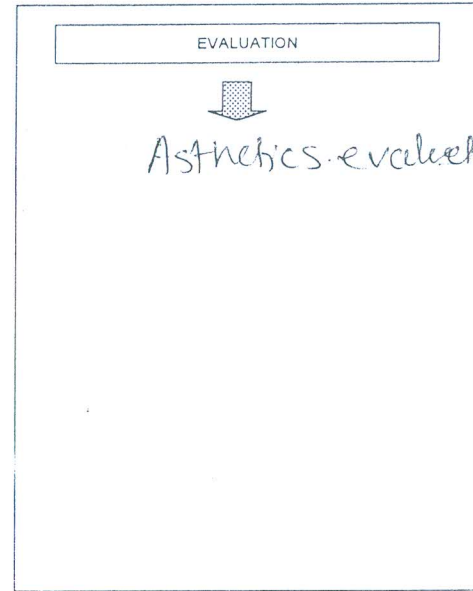
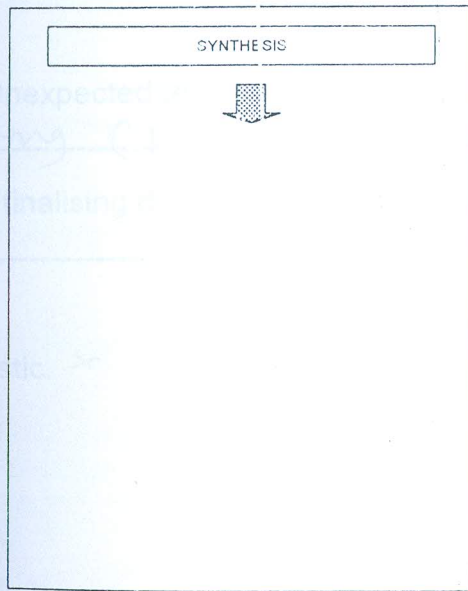
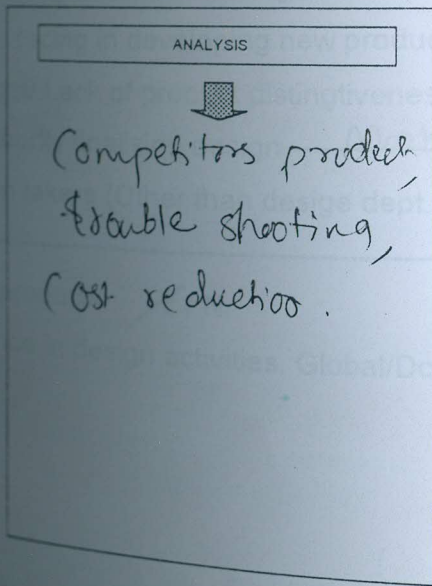
Deciding product image/brand image

Deciding co-ordinating structure

Test marketing

Total design	Engineering design	Product design
100	<input type="text"/>	<input type="text"/>

Total design	Function, Engineering design	Aesthetics	Ergonomics, Product design
100	<input type="text" value="15"/>	<input type="text" value="70"/>	<input type="text" value="15"/>



Testing

3. Non design work required: ... E.g. Leadership, Costing, prot, vendor development, prototype work, m/fering, feedback from market

4. Do you use target costing. X/N.

5. Why? ...  
6. Overlapping areas (Design & Manufacturing/ Marketing) One m/fering of products starts... ends...  
Product-cost design.

7. Relation between design and manufacturing.

Manufacturing domination/Integration/Cross function/Product-Process/ Design domination.

8. Problems facing in developing new products.

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/ Costing ← snap fitting

9. Final authority finalising design Marketing (project head v.p marketing)

10. Decision takers (Other than design dept.) in finalising design Marketing @ [Design & Testing]

11. Global products X/N.

12. Difference in design activities. Global/Domestic. x

QUESTIONNAIRE

R. J. Bhatti Design

1. For your company,

Y

N

• Design is a goal directed problem solving.

• Imaginative jump from present to future possibilities but in extra time. extra mind.

• Product innovation is part of design → design itself is a problem solving & when you solve a problem. the solution is a modification.

• Design includes: anything that does work efficiently. then it used to do before.

Product design

Process design

Corporate identity design

Person & Designation

Yogesh Dandekar, Designer

products.

Corporate identity.

Following activities are part of design:

Market research to find customer needs

Y

N

Strategic decisions of product design

Selection of project for product development

Manufacturing process design

Product cycle time decisions is an integral part of product design.

Deciding product image/brand image

Deciding co-ordinating structure ✓ Define Hierarchy.

Test marketing

Total design	Engineering design	Product design
100	40	60

INDUSTRIAL DESIGN. <del>Product design</del>	FUNCTION Engineering design	Aesthetics	ERGONOMICS <del>Product design</del>
100	50	30	20

ANALYSIS

↓

Studying manufacturing process and existing trends in dealing with the similar corporate identity projects

- Finding new & innovative ways of manufacturing.

SYNTHESIS

↓

Comparing different materials & process

EVALUATION

↓

No. evaluation.

3. Non design work required..... E.g. Leadership To handle site work & prototyping,

4. Do you use target costing. Y/N.

5. Why? —

6. Overlapping areas (Design & Manufacturing/ Marketing) Everything is done by design dept.

7. Relation between design and manufacturing. (No m/fging department)  
Manufacturing domination/Integration/Cross function/Product-Process/

8. Problems facing in developing new products. Moving target/ Lack of product distinctiveness/ Unexpected technical problems/ Mismatch in the function/

9. Final authority finalising design ? (....???)

10. Decision takers (Other than design dept.) in finalising design Consultancies involved

11. Global products Y/N

12. Difference in design activities. Global/Domestic. ✓

Mr Barne (Design & development cell)

QUESTIONNAIRE

1. For your company, -----

Compton

Y

N

• Design is a goal directed problem solving.

• Imaginative jump from present to future possibilities

• Product innovation is part of design

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation:

D & Development. (Mr. Barne) products (Motor Industrial).

Vice-presidents  
A.D

Following activities are part of design:

Market research to find customer needs

+1

Y

N

New product concerned.

Strategic decisions of product design

Selection of project for product development

Manufacturing process design

Product cycle time decisions

[Design] takes design

Deciding product image/brand image

Deciding co-ordinating structure

Test marketing

Business,

3. Non design work required.... E.g. Leadership,

4. Do you use target costing. Y/N.

5. Why? Need

6. Overlapping areas ( Design & Manufacturing/ Marketing)

Test marketing, understanding customers

7. Relation between design and manufacturing.

Manufacturing domination/Integration/Cross function/Product-Process/

8. Problems facing in developing new products.

Facilitates. ↑ tools.

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/

9. Final authority finalising design. Don't know

10. Decision takers (Other than design dept.) in finalising design → Divisional heads

11. Global products Y/N.

12. Difference in design activities. Global/Domestic.

Aesthetics — for global products.

QUESTIONNAIRE

1. For your company, Bajaj Electrical.

Y

N

• Design is a goal directed problem solving.

• Imaginative jump from present to future possibilities

• Product innovation is part of design

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation:

Sandeep Thorbone, Ragesh Shelake  
product designers

products

Electrical domestic products.

Following activities are part of design:

Market research to find customer needs

Y	N
<input type="checkbox"/>	<input checked="" type="checkbox"/>

Strategic decisions of product design

<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	-------------------------------------

Selection of project for product development

<input checked="" type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------

Manufacturing process design

<input checked="" type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------

Product cycle time decisions

<input type="checkbox"/>	<input checked="" type="checkbox"/>
--------------------------	-------------------------------------

Deciding product image/brand image

<input checked="" type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------

Deciding co-ordinating structure

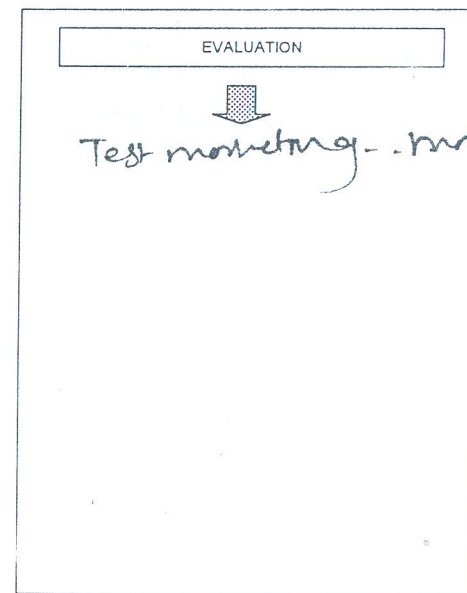
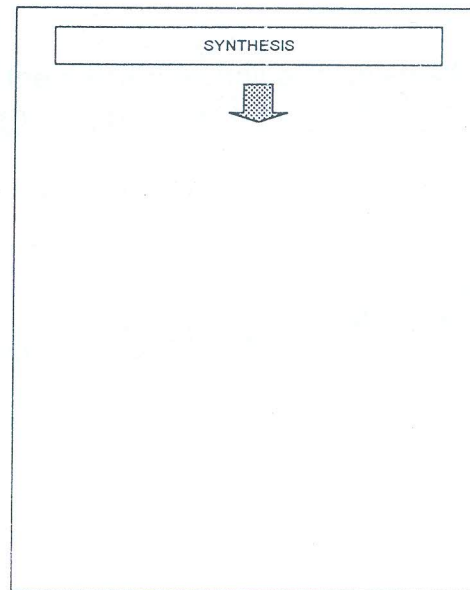
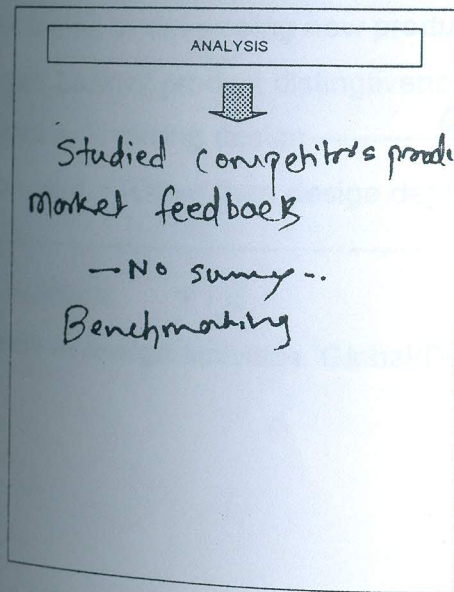
<input checked="" type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------

Test marketing

<input checked="" type="checkbox"/>	<input type="checkbox"/>
-------------------------------------	--------------------------

Total design	Engineering design	Product design
100	30	70

Total design	Function Engineering design	Aesthetics	Ergonomics. <del>Product design</del>
100	45	40	15



3 Non design work required..... E.g. Leadership

4 Do you use target costing. Y/N. (running expenses, ...).

5 Why?

6 Overlapping areas (Design & Manufacturing/ Marketing) (Purchase developments/ Promotional. <sup>tools of product</sup>)

7 Relation between design and manufacturing.

Manufacturing domination/Integration/Cross function/Product-Process/

8 Problems facing in developing new products.

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/

Inest., Time constraint. L of prod actual

9. Final authority finalising design R&D, marketing & top management

10. Decision takers (Other than design dept.) in finalising design Marketing V.P.

11. Global products Y/N.

12. Difference in design activities. Global/Domestic.

[standards, cost, price.]

QUESTIONNAIRE : DESIGN PERCEPTION IN INDUSTRY

1. For your company, Indesign Consultancy Y N

• Design goals are set by marketing/-----

• Futuristic product design is part of design activities. e.g.....

• Redesign is a part of design activities.

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation: Sunil patel

products: All type of consumer products.

Following activities are part of design:

Market research to find customer needs

Y

N



Strategic decisions of product design



Selection of project for product development



Manufacturing process design



Product cycle time decisions



Deciding product image/brand image



Deciding co-ordinating structure



Test marketing



2.

Total design	Technical Aspects	Humanistic Aspects
100	-	-

3. Non design work required.....E.g. Leadership----- ✓

4. Do you use target costing. Y/N. ✓

5. Overlapping areas ( Design & Manufacturing/ Marketing)----- m/fering process design, ✓

6. Relation between design and manufacturing. ✓

Manufacturing domination/Integration/Cross function/Product-Process/----- ✓

Problems facing in developing new products. ✓

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/----- ✓

Final authority finalising design----- ✓

Decision takers (Other than design dept.) in finalising design----- ✓

7. Global products Y/N. ✓

Difference in design activities. Global/Domestic. yes. ✓

QUESTIONNAIRE : DESIGN PERCEPTION IN INDUSTRY

1. For your company, ----- Onida -----

Y

N

• Design goals are set by marketing/-----

• Futuristic product design is part of design activities. e.g.....

• Redesign is a part of design activities.

• Design includes:

Product design

Process design

Corporate identity design

Person & Designation:

Vinod Hingorani (Industrial Designer. products: T.V., web courses.

Following activities are part of design:

Market research to find customer needs

Y                      N  
                     

Strategic decisions of product design

Selection of project for product development

Manufacturing process design

Product cycle time decisions

Deciding product image/brand image

Deciding co-ordinating structure

Test marketing

2.

Total design	Technical Aspects	Humanistic Aspects
100	<input type="checkbox"/>	<input type="checkbox"/>

3. Non design work required.....E.g. Leadership, marketing research.

4. Do you use target costing. Y/N.

5. Overlapping areas ( Design & Manufacturing/ Marketing) Test marketing, Customer Survey.

6. Relation between design and manufacturing.

Manufacturing domination/Integration/Cross function/Product-Process/-----

Problems facing in developing new products.

Moving target/ Lack of product distinctiveness/Unexpected technical problems/Mismatch in the function/-----

Final authority finalising design C.E.O.

Decision takers (Other than design dept.) in finalising design C.E.O.

7. Global products Y/N.

Difference in design activities. Global/Domestic. yes.

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- Eric Schneider- **Professional practice in design consultancy.**
- Hollins/ Pugh- **Successful product design.**