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INDUSTRIAL DESIGN IN CANADA:
ITS ROLE AND STRATEGIC IMPACT

Prepared For: DESIGN CANADA
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INTRODUCTION

Design has become a matter of interest for business and industry.¹ The big surprise in this growing interest is not that it exists today, but that it took so long to appear. Design, after all, is a very basic activity, as old as mankind. You cannot build or make anything without a design of some sort, even if it is nothing more than some scratches in the beach sand, or a glint in someone's eye. Every piece of the entire man-made environment had to be designed before it could be made.

The argument to devote considerable time, effort and resources to effective industrial designers is a powerful one. Design is the creative force which shapes all the products we produce. Yet we, as Canadians, are constantly reminded that we lack design capability on a par with other industrialized nations. Swiss designers are responsible² for not only the world's finest watches, but also produce components for time pieces made elsewhere with Swiss-designed machinery. Italian automobile stylists are commissioned by American, British, Japanese, French and Russian car makers. Sweden designs cars and aircraft for world markets, and Denmark exports furniture made from imported wood. None of these countries has exclusive claim to manufacturing technology: production resources constitute the common denominators and design talent, the unique national ingredient.

This report investigates the role of industrial design in Canada for generating export sales. In particular, the study focusses on the position that industrial design occupies in the business activities of

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1. Taken from: George Nelson and Paul Schmitt, Design For Business Survival, Canadian Design Lectures (Ottawa: Information Canada, 1974), pg. 19.
 2. Taken from: George Nelson and Paul Schmitt, Design For Business Survival, op. cit., pg. 12.

of Canadian firms involved in export marketing, and on the strategic impact industrial design has, or might have, in creating export revenue for Canadian firms.

The specific objectives of the study were as follows:

1. To define industrial design and its relationship to other activities.
2. To define the role and activities of the industrial designer.
3. To provide an overview of the new product development process, and in particular the part that industrial design plays.
4. To determine the strategic impact that industrial design has, or should have, on Canadian export marketing.
5. To provide an indication of where Canada fits with respect to other countries with respect to industrial design, and the differences between countries.
6. To outline promising areas for industrial design in Canada.
7. To provide normative guidelines for improved practice in industrial design in Canada.

The report is divided into two parts. Part I reports the results of an extensive literature search on industrial design and its commercial and international implications and impacts. A computer assisted search (Harvard & MIT facilities) provided added input to this facet of the report.

Part II details the results of an investigation involving personal interviews of practitioners, consultants and advisors involved in export marketing and industrial design. The findings here move away from the strictly speculative, theoretical and normative discussion of Part I, and paint the picture of actual practice and the real world impact of industrial design.

PART I

THE ROLE OF INDUSTRIAL
DESIGN: A REVIEW OF THE LITERATURE

The purpose of a business is to create a customer. So said Peter Drucker in his book, The Practice Of Management, published 25 years ago.³ The role of product - its functioning and its appearance - is a central element in the firm's customer attraction strategies. There are many ways to induce potential customers to buy: effective advertising and promotion, aggressive pricing policies, a strong salesforce and good channels, to name a few. But it is the product offering itself that the customer buys and seeks satisfaction from; and so the product strategy becomes central to the success of a firm's marketing effort.

The critical role of product function and appearance is perhaps more true in international markets than domestic ones. With heightened competition and widespread international variations of customer preferences, the role of product design to gain a differential advantage and better appeal to designated target markets becomes even more vital.

In Part I of the report, the strategic role of industrial design in generating sales, particularly international sales,⁴ is examined. The information and arguments reported here are taken from the currently available literature. Perhaps most noticable about the literature in the field of design is the virtual absence of empirical or "real world" research or data. Thus, the arguments presented here are necessarily based on the opinions, experiences and speculations of others (as opposed to first hand

3. Peter F. Drucker, The Practice Of Management (New York: Harper & Row, 1954), pg. 37.

4. The term "international sales" in this report denotes export sales from Canada, and not sales from production abroad, even though the production facilities may be Canadian-owned.

research), resulting in a great many different perspectives on the role of design. Several definitions of design are first presented, followed by views from various disciplines about the actual or normative position of design in an industrialized economy.

The Definition Of Industrial Design

The idea of industrial design as a separate and economic activity has its roots at the beginning of the industrial revolution. It evolved as objects traditionally made by craftsmen gave way to products produced by machines in factories. Joshua Wedgewood's factory-made ceramic product line is often cited as an example of early industrial design.

From about 1840 to recent decades, the notion of design was bound up with the notion of aesthetics; that is, with the proper appreciation of beautiful things. This pursuit of beauty was largely for cultural, social and philosophical purposes, than for purely sensual or practical purposes.⁵

Although modern industrial design has been practiced and recognized since the early decades of the present century, attempts to define the discipline in terms acceptable to its practitioners date only from the early 1960's.⁶ This anomaly can be traced to the sharp disagreement among industrial designers, as well as users of industrial design, as to the limits of the profession.

An early definition of industrial design, adopted by ICSID⁷ in 1964 was:

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5. Source: L. Bruce Archer, Design Awareness And Planned Creativity In Industry (London & Ottawa: Design Council Of Great Britain and DITC, Canada, 1974).
 6. This section taken from: Design For Export (Geneva: International Trade Centre UNCTAP/GATT, 1975), pg. 10.
 7. International Council Of Societies Of Industrial Design (ICSID), Brussels.

"Industrial design is a creative activity whose aim is to determine the formal qualities of objects produced by industry. These formal qualities are not only the external features but principally those structural and functional relationships which convert a system into a coherent unity from the point of view of the producer and user. Industrial design extends to embrace all aspects of human environment which are conditioned by industrial production."

The world famous British designer, L.B. Archer,⁸ recently formulated a more concise definition of industrial design:

"The design of artifacts intended for production by industrial processes in which the aesthetic and other human factors play a significant role."

A more useful definition views the concept in terms of design's focal areas:⁹

"Industrial design is tightly interwoven with and dependent on the socio-economic context in which it is exercised...it is concerned with the improvement of usability of industrial products¹⁰ which forms part of the overall quality of a product. From the point of view of industrial design, a product is primarily an object which provides certain services, thus satisfying the needs of user...it is concerned with 'formal properties' of industrial products. Formal characteristics refer to the overall appearance of the product, including its three dimensional configuration, its 'physiognomy', its texture and color...it is an innovative activity. It is one special type of technological innovation...it is concerned with the marketability of the product in that it relates the product to its market in terms of both raw material supply and product demand".

8. L.B. Archer; Head of the Department of Design Research, Royal College of Art, London, U.K.

9. Source: Gui Bonsiepe, Development Through Design (United Nations Industrial Development Organization, June 1973).

10. Here the term industrial product refers to a product produced by an industrial process, as opposed to the output of craftsmen or artists. i.e., a manufactured product.

A more recent definition, and perhaps the broadest in scope,
is: ¹¹

"Design is the preparation of a prescription for some artifact or system in the light of all the relevant function/constructional, economic, marketing, ergonomic and aesthetic requirements".

The confusion surrounding "what industrial design is" is not limited to the profession. A public appreciation of industrial design is generally lacking, ¹² even in industrialized nations. To many, a "designer" is a person whose main concern is with the functioning of a product and its other technical aspects. If the appearance of a product is a key factor in its sale, then the "stylist" is called in to create an appropriate "package" for the mechanism created by the "designer", be it a typewriter (the housing), an automobile (the body) or a portable radio (the case). This division of labor is a convenient and easily understood concept, but it is wrong and misleading. It is one of the reasons why the industrial designer is often equated with the "stylist", and has even been labelled a "cosmetician of products", an even more inaccurate definition.

The main difference between engineering design and industrial design can be understood by comparing the following definition of engineering design to those offered above:

"Engineering design is the use of scientific principals, technical information and imagination in the definition of a mechanical structure, machine or system to perform prespecified functions with the maximum economy and efficiency".

11. Source: L.B. Archer, op. cit. The term ergonomics means biotechnology, i.e., the relationship between human beings and machines.

12. Parts of this section taken from: Design For Export, op. cit.

Industrial design, then, is a specialized engineering discipline based on anthropology, ergonomics and visual and tactile relationships. No straight-forward demarcation exists between it and engineering design: in practice the overlap varies according to the nature of the product, and the contribution of different designers is affected by their individual talents, personalities, experiences and the needs of the project and team. On some projects, it is almost impossible to distinguish between the works of the industrial and engineering designer.

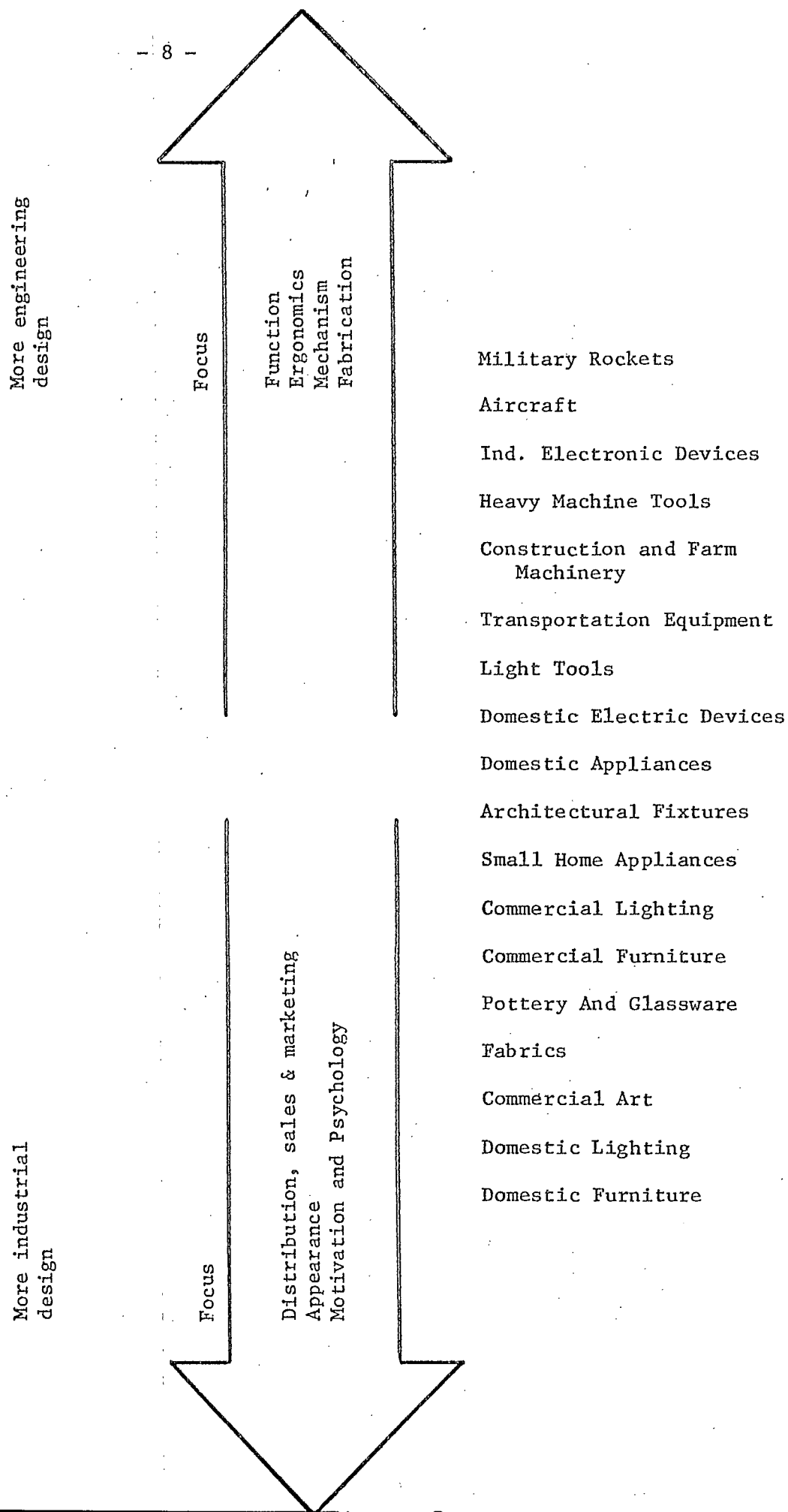
The total design activity is best described as a "design spectrum". The composition of the spectrum - from aesthetics and ergonomics to mechanics and electronics - depends on the nature of the product; for example, fashion goods and lighting fixtures at one end to machine tools and turbines at the other (Figure 1). Industrial designers, be they industrial or engineering, will find themselves working on that part of the spectrum which best suits their abilities and the project on which they are engaged.

The issue of "what is industrial design" poses particular problems for North Americans. In the first place, virtually all definitions of design are European in origin, and may not fit with our notion of industrial design. Secondly, the question of a definition is perhaps more academic in Europe: industrial design in Europe has a long history, dating back to the days of craftsmen and artists; and industrial design plays a more important and more visible role in European industry. Not so in North America, which lacks the history and tradition in industrial design. Because formal industrial design is often foreign to the North American firm, understanding first what industrial design is (versus engineering design or styling) is of particular importance to us.

Finally, North Americans have been designing products for many years,

FIGURE 1

RELATIVE EMPHASIS OF DESIGN
ON DESIGN SPECTRUM



and obviously have been performing industrial design functions (whether we called it industrial design or by some other name). Because most North American managers are not that familiar with the European notion of industrial design, or industrial designers, each has his own definition of what industrial design is. And these definitions range from engineering design right through to "cosmetics". Thus discussing the role and strategic impact of industrial design in North American firms becomes difficult given no clear, consistent and universally accepted definition of industrial design amongst North Americans.

The Importance Of Industrial Design: An Economic Perspective

The following discussion summarizes the main economic arguments in favor of promoting industrial design at the national level as an effective means of increasing a country's export revenue through expanded sales of manufactured goods.¹³

According to one school of thought, a country at a low level of industrialization should concentrate on developing products for the home market, since it is not in a position to compete on world markets, where the products of industrialized nations predominate. A corollary strategy is to protect local industry through tariff barriers, thereby fostering local manufacture for home markets. If this line of reasoning is followed, then industrial design has little impact on the nation's export strategies. Some economists argue that Canada has suffered from this inward-looking approach: protectionist policies dating back to the 1800's and a home-market orientation have yielded a branch plant economy whose products are simply uncompetitive in terms of price and design in world markets.

13. Parts of this section are taken from: Design For Export, op. cit.

A contrary argument is that manufacturers in developing countries¹⁴ should attempt to compete on international markets. This argument has two facets. By adapting products to international design standards, manufacturers can automatically qualify to compete in lucrative foreign markets, providing that prices, delivery times and other non-product variables can satisfy the requirements of foreign buyers. The other side of the argument is that unless a country's manufacturing sector can compete with foreign products and designs, the domestic market will rapidly be dominated by foreign made products. The normal response is to erect high tariff barriers, thereby supporting local industry, but at the same time, robbing it of the necessity of developing the expertise and economies of scale needed to compete internationally.

Recent years in Canada have witnessed a move away from protectionism and towards international markets. A necessary facet of this industrial strategy is that Canada be competitive internationally in terms of product technology and design and, of course, in terms of price. Economic forces adjust prices in short order, as nation's currencies fluctuate to reflect relative price competitive advantages. Hence Canada's depreciated dollar has made many Canadian goods price competitive. But competitiveness in product design and technology is not acquired as quickly. Indeed, long term strategies are needed to develop these expertises.

The importance of design in a nation's export expansion strategy has been well documented:¹⁵

- 0 A product that may satisfy domestic market requirements may not be automatically accepted on foreign markets, particularly in industrialized countries where consumers demand (and get!) good design and top quality.

14. International economists generally define Canada to be close to a "developing country" in terms of secondary manufacturing.

15. Source: Design For Export, op. cit.

- If a newly designed product is to be sold in large volume on many markets, it must embody sufficient originality to ensure that it is not easily copied. A well-designed product is likely to have an extended life cycle, thereby justifying the initial investment in the first place, and possibly yielding higher returns to investment to the export country's manufacturers.
- Design is a fundamental factor in the entire process of research, development, production and marketing. If a high standard of design is encouraged in the manufacturing sectors, all other sectors of the economy dependent on manufacturing will benefit.
- The design content of a product is one of the largest value-added components of the product, and consumes less in terms of capital and raw materials than any other input factor contributing to the creation of a product. Since the design component is synonymous with human creativity, manufacturers embodying a high standard of design are mainly dependent on skilled human resources (which are potentially abundant in Canada).

The Marketing Concept And Industrial Design

The modern marketing concept has been heralded as the most advanced corporate philosophy. The concept is predicated on the fact that it is the customer who determines the fortunes of the firm; that the customer should become the focus of the firm's attention; and that "it is easier to orient the firm to the needs of the market-place, than to the to adjust the market to the wishes of the firm". This customer-first policy, popularized by the General Electric Corporation in the late 1940's, has been since rewritten as:

"The marketing concept is a customer orientation backed by integrated marketing aimed at generating customer satisfaction as the key to achieving organizational goals".¹⁶

Important facets of the marketing concept include:

16. See for example: P. Kotler, Marketing Management: Analysis Planning And Control (Englewood Cliffs, N.J.: Prentice Hall, 1972), pg. 17.

- ① market segmentation and the specification of target markets.
- ① differential advantage strategies.
- ① the integrated marketing mix.

Traditional economics views competitive markets as homogeneous entities, with many buyers dealing with many sellers. Market segmentation, in contrast, recognizes that buyers differ in their needs, wants, and behavior; and it is to the firm's advantage to selectively serve one or more sub-groups or "market segments". By target marketing, the firm is able to develop a tailored strategy to the subgroup, thereby outdoing competitors who adopt universal strategies. The notion of target marketing is best summed up by the following popular adages:

"Different strokes for different folks," and

"You can't be all things to all people."

International boundaries are always a consideration in segmentation strategies. Firms may decide to segment their markets first by countries, serving each country or area uniquely (an example is Nestlé, whose products and marketing strategies are tailored to each country). In effect, the country becomes the "market segment". Alternately firms may segment markets across national borders, and serve a similar clientel in each country (for example, the segment, "high priced prestige car buyers" in every country, in the case of Mercedes Benz). This second strategy recognizes that basic common needs may exist in many different countries and that by identifying these needs in advance, and by optimizing the design of a product to embrace minor variations within those basic needs, the potential size of the market can be greatly expanded. ¹⁷

17. See for example: John E. Blake (ed.), Design For European Markets: A Management Guide (London: Design Council Of Great Britain, 1972), pg. 7.

Having decided upon a segmentation strategy and defined its target markets, the firm now turns to developing a "marketing mix" strategy; that is, the best settings for its marketing decision variables (Figure 2). The marketing mix is based on the premise that sales are a function of many variables, all acting in concert - product, price, promotion, distribution service, etc. - and an integrated balancing of these elements is essential to effective performance.

The role of product strategy - quality, technology, design - looms as an important element of the marketing mix, although not the only variable which might be readjusted to generate more sales. Thus, industrial design becomes one of many possible inputs into the elements of the market mix.

A differential advantage strategy is the pillar of successful marketing, particularly in highly competitive markets. The notion is that the firm must seek to gain a differential advantage over other firms in its target market by focussing on one element of the marketing mix. Thus the firm may rely on price or product or delivery or service, etc. as its core strategy to outdo its competitors. Often the firm builds on its distinctive competence or unique resource in order to develop its differential advantage.

In international markets, price is an obvious core strategy to yield a differential advantage, particularly in the case of exporting countries with large home markets (and established economies of scale) or low cost factors of production (low cost labor, for example). Canada is blessed with neither, and hence must generally seek its differential advantages elsewhere. Product strategy, and in particular product design, provides an excellent opportunity for Canada to develop a differential advantage through innovative and unique design, and to exploit the creative and educated human resources the country is fortunate to have.

FIGURE 2
THE MARKETING PLANNING PROCESS

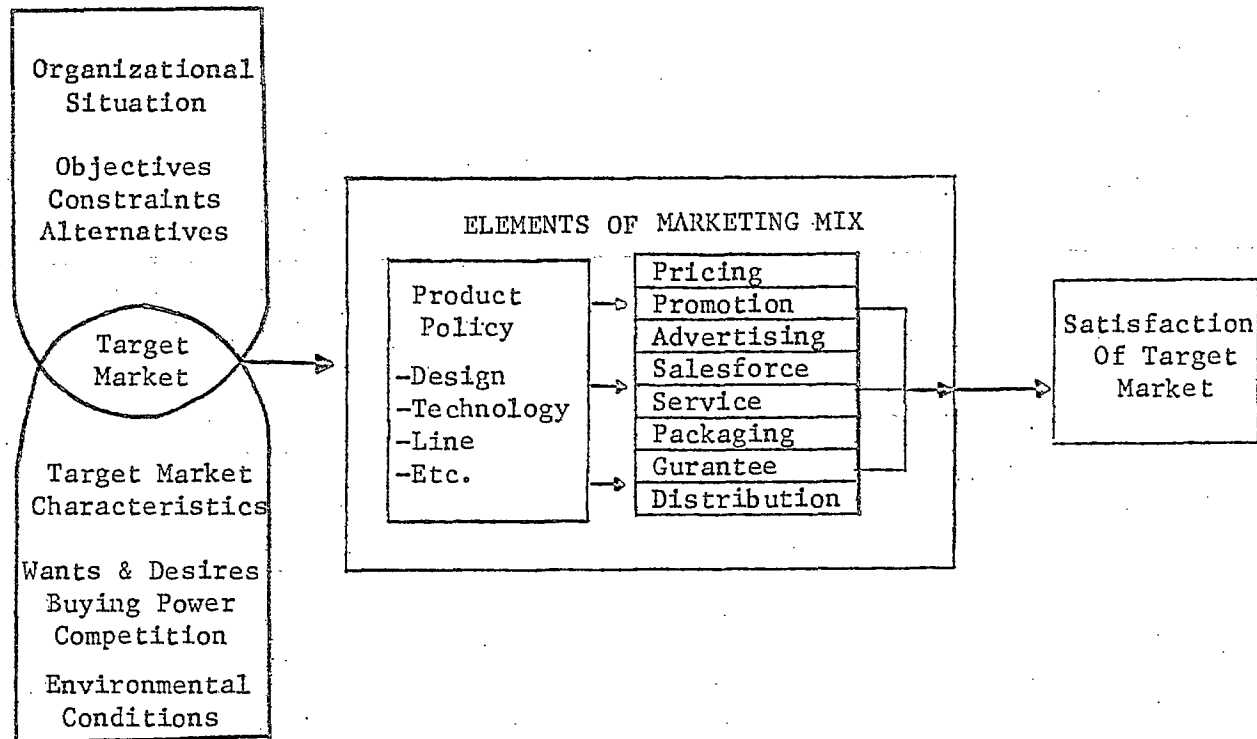


Figure 2: The Marketing Planning Process. Target market selection precedes the selection of the elements of the marketing mix.

Equally important is that the firm must be market oriented and not product oriented (focus on customer needs and satisfaction rather than a preoccupation with technology and product attributes). Products cannot be designed in a vacuum; there is a vital need for market integration, feedback and marketing research to ensure a customer oriented design function. A strategy encompassing a focus on design as the key element of the marketing mix, with a strong market and international orientation, is certainly a viable for manufacturers (in Canada) seeking export sales.

Product Development And Industrial Design

Industrial design has applicability in both the redesign of existing products as well as in the design of new products. What distinguishes a "new" product from an existing one is often a fine line. Indeed, product redesign may be so dramatic that the net result is a "new product".

The field of new products (or substantial redesign of existing ones) is an important one for Canada. Increased product development and R & D spending by industry appear to be inherent goals of current federal public policy. The hypothesis is that new products generate a temporary monopoly position for the developer, thereby generating increased sales and profits (both domestically and abroad).

What makes a new product a success? The question continues to elude most firms, as the majority of new products that are developed are failures. One U.S. study reports that five out of six manhours spent by scientists and engineers on developing new products are wasted on products which fail or are cancelled.¹⁸ (Current U.S. new product development expenditures are estimated to be \$51 billion (1979), which does not include commercialization costs).

18. Booz, Allen & Hamilton, Management Of New Products, Booz, Allen & Hamilton Inc., 1968.

What separates the "winners" from the "losers" in the new product game was the topic of a recent Canadian investigation into industrial product innovation. Based on a sample of almost 100 successes and 100 failures, the three key variables were (in descending order of importance):¹⁹

- ① having a unique and superior product;
- ② having solid market knowledge and executing market activities (market research and market launch) well;
- ③ having a good product/company fit in terms of technology and production, and executing these activities well.

The single most important dimension leading to industrial new product success was product uniqueness and superiority. Such unique superior products were typically highly innovative and new to the market; incorporated unique features for the customer; met customers' needs better than competing products; allowed the customer to reduce his costs or to do something he could not previously do; and were of higher quality (tighter specifications, stronger, longer, etc.) than competing products.

That product design and quality is such an important ingredient in new product success is so obvious and truistic that it tends to be overlooked.²⁰ This result has also been found in the case of consumer goods, and in studies outside of North America. But the fact remains that a large number of firms tend to ignore this finding, and continue to develop and launch "me too" products aimed at highly competitive markets. What is so often forgotten is that it is the product which is the core in central strategy

19. As reported in: Robert G. Cooper, "Identifying Industrial New Product Success: Project NewProd", Industrial Marketing Management, Vol. 8, No. 2, 1979; also by the same author: "The Dimensions Of Industrial New Product Success", Journal of Marketing, July, 1979.

20. An economic advantage (price) while a factor in success, was not as critical as product itself.

in most new product ventures; and it is through technology, engineering design and industrial design where the firm must seek its differential advantage.

The process by which firms develop new products has been extensively investigated. The new product process consists of a stagewise sequence of activities, beginning with idea and ending with launch. An idealized version of this stagewise model is shown in Figure 3.²¹ Stages on the left side are technological and production activities (inward oriented), while those on the right are market activities (outward oriented). A balance between these two sets of activities - market and technological - is thought important for successful product development.

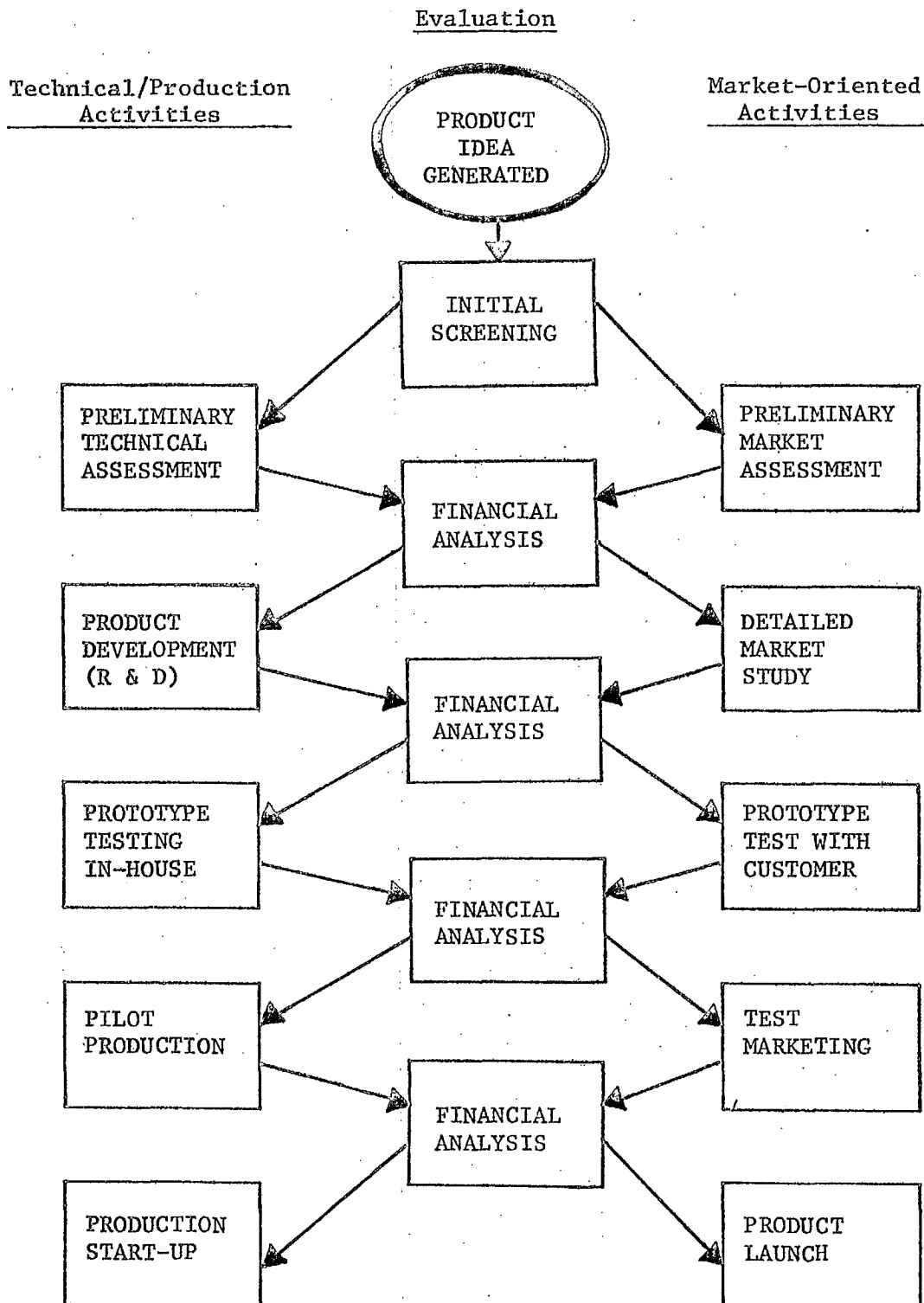
Note that there is no stage designated "industrial design". Industrial design cannot be viewed as a stage, but as a function that is pervasive throughout the entire new product process. Industrial design is a function much like other human functions, such as planning, decision making and information acquisition, which are also prevalent throughout the new product process.

Because industrial design is a pervasive function (rather a specific stage), focussing on industrial design and its strategic impact proves difficult. Identifying the strategic role of industrial design is as elusive probing the results of "good decision making" or "effective planning". (as is seen in Part II of this report). That is, it is taken for granted that all these functions - planning, decision-making, designing, etc. - when proficiently undertaken, yield positive results; but actually measuring the results is quite another matter.

21. Robert G. Cooper, Winning The New Product Game, (McGill University, 1976).

FIGURE 3

THE INNOVATION PROCESS



The Impact Of Design: The Industrial Designer's Perspective

The designer, as might be expected, views industrial design as the central strategy for corporations. Thoughts such as the following abound in the often emotional writings of industrial designers:

"...the essence of business is the modulation of value, price and cost, and the very core of manufacturing business is the manipulation of the marginal qualities of artefacts. Design is not just an element in corporate strategy. So far as manufacturing business is concerned, it is the key element." 22

Although designers appear to be convinced of the dominant role that design should play, it is clear that few other professionals or managers are, and the design literature is replete with pleas for more effective design.

Examples are:

"There is an abundance of good designers in America. The basic problem is that corporate management does not know what good design is and would not know what to do with a good designer if it had one." 23

"In all the technologically advanced countries, the whole educational system seems to produce visual cripples or visual illiterates. That is because an industrial society doesn't need people who can see." 24

The reasons for the abysmal state of design in North American business include: 25

22. L. Bruce Archer, op. cit., pg. 83.

23. Walter Hoving, "The Crisis Of Design And Aesthetics In American Management", from The Art Of Design Management: Design In American Business, ed. by T. Schutle (New York: Tiffany & Company, 1975), pg. 1.

24. Nelson and Schmitt, Design For Business Survival, op. cit., pg. 88.

25. Walter Hoving, "Why Are We Underdeveloped In Design", New York Times Magazine, 112 (November 1962), pg. 37.

1. the growth of big business and the resulting specialization of job functions.
2. lack of design awareness in big corporations.
3. lack of design in management education (the subject is not taught in business schools).
4. concern with efficiency to the exclusion of good design.

Many arguments have been put forward by the industrial designer for the need to incorporate good design into North American business practice. Most such arguments are emotional, but the "value added" notion of design does have economic merit.²⁶

The value added argument begins with the premise that the purpose of a business is to make a profit. Profit is the channel through which the added wealth generated by industrial processes is injected into the economy.²⁷ But a commercial transaction can be profitable only when the cost of the product or service is less than the price to the buyer.²⁸ At the same time, the buyer will buy only when the value to him is equal or greater than the price demanded. "Value" is the critical word: price and cost are essentially concerned with money, and are the subjects of economics; value is concerned with worth, desirability or utility, and is the subject matter of philosophy.²⁹

The act of assigning value to an object is an act of judging or choosing or appraising. All value judgements make or imply comparisons. Value is a quality of an item which induces people to give up something else of value

26. Not that these emotional arguments are without merit; simply that to be widely accepted in North American business, good design must also have an economic argument.

27. Peter Drucker, op. cit.

28. Taken from: L. B. Archer, op. cit.

29. This statement is not strictly true. Economists deal at length with value in their "utility theory" models.

in order to enjoy or possess it. Many attributes contribute to the value of an object, including: ³⁰

- usefulness (e.g., producing an otherwise unachievable result).
- sense of security.
- availability.
- rarity (and novelty).
- customization.
- aesthetic.

The list of "value inducing attributes" is typically not familiar to marketers, engineers and managers. Their list of attributes include: function, mechanism, distribution, packaging, etc.

Industrial designers argue that it is their job to strive to maximize all of these "value inducing attributes", yet at the same time to minimize the cost elements (material costs, production process, investment, etc.). ³¹ Thus the industrial designer becomes the key link in commercial effectiveness. It is he who manipulates the attributes of products, and creates value. And the spread between the value of the product and its cost determines selling price and volume, hence profits.

The argument that it is the designer who manipulates attributes and creates "value" in a product, and that product value as the key factor in corporate sales and profits, places industrial design as the central element in corporate strategy.

Summary: Part I

Industrial design is a vital ingredient to corporate success and to

30. Taken from: L.B. Archer, op. cit.

31. Taken from: L.B. Archer, op. cit.

export marketing. So argue the pundits: the economists, the marketers, the technological innovators, and the designers arrive at similar conclusions using arguments in their respective disciplines. In addition, scattered evidence in the form of case histories (see Appendix A for examples) supports the contention. What is particularly disturbing in all this literature is the total absence of empirical research to identify the actual impact, role and practice of industrial design as an ingredient in successful export marketing.

PART II

RESULTS OF THE FIELD STUDY

What is the role of industrial design in the corporate activities and strategies of Canadian firms? Does industrial design really have the strategic impact on firm's sales and export revenue that the economists, marketers and designers argue that it should? These and other questions are the focus of Part II of this export. Part II reveals the results of an investigation into actual practice, based on personal interviews with managers and other experts.

The main topics around which this part of the report is organized include:

1. The characteristics of the responding firms: for example, their ownership; level of export sales; etc.
2. The nature and allocation of resources spent on industrial design: for example, a breakdown of who does industrial design within firms.
3. The role and focus of industrial design within firms: for example, how does industrial design fit into the new product process?
4. The strategic impact of industrial design: for example, how important is industrial design relative to other variables (such as price), in generating export sales?
5. Support for industrial design: a quick look at outside support for industrial design in Canada.
6. A comparison with other countries: a brief look at the differences between design in Canada and abroad.

Summaries of the unsolicited comments and informed opinion of the respondents are also reported, in order to gain a further insight into what ails Canadian industrial design and export marketing (and what might be done). The final section of presents the major conclusions of the report.

The Characteristics Of The Respondents

A total of 22 respondents were personally interviewed in order to provide the data for the field investigation. Interviews were based on a lengthy questionnaire, with both open-ended and close-ended questions.³²

The respondents included:

1. Eleven manufacturing firms known to be active in industrial design and involved in export sales.
2. Four trade commissioners (Federal Government) recently returned from foreign duty.
3. Four industrial design (consulting) firms.
4. Three trading houses, exporting from Canada.

The eleven firms had been purposefully selected to yield a sample of informed and "better practice" companies with respect to both industrial design and export marketing. All sizes of firms were represented, including a new firm with sales of only a quarter million dollars through to a well-known giant with sales of \$350 million (Table 1). The mean sales were about \$40 million annually, with seven firms having sales less than \$5 million.

Firms from a wide variety of industries were represented:

- ① a well-known Quebec manufacturer of snow-mobiles and motorcycles, with sales of \$350 million;
- ② another Quebec company, producing an internationally famous one-man sailboat;
- ③ a medium sized firm making electro-mechanical devices;
- ④ a small but very successful manufacturer of commercial ceiling/lighting systems;
- ⑤ three companies involved in machinery - industrial machines, machine tools and industrial hydraulics;

32. Different questionnaires were used for different types of respondents.

TABLE 1
CHARACTERISTICS OF FIRMS

ANNUAL SALES	More Than \$20 Million	\$5-20 Million	Less Than \$5 Million	Mean Sales
	2*	2	7	\$39.5 Million
OWNERSHIP/ TYPE OF FIRM	Foreign Owned	Canadian Owned Domestic	Canadian Owned Multinational	
	1	6	4	
OPERATIONS LOCATIONS	Firms With Overseas Faculties	Firms With Two Or More Canadian Locations		
	6	4		
EXPORT SALES (As % Of Total)	More Than 80%	50 - 80%	Less Than 50%	Mean/Deviation
	3	5	3	Mean = 56.8% S.D.** = 28.7%
ACTIVE VS. PASSIVE EXPORTERS	Active	Passive: Laissez Faire		
	9	2		
EXPORT ACTIVITIES	By Own Company	By Agent, Distributor	Use Both	
	7	2	2	

* Number of Firms

** Standard Deviation is a measure of the spread of a distribution, i.e., approximately 2/3 of the cases lie within \pm one standard deviation of the mean.

- ① a small firm designing process control systems;
- ② a designer and maker of display show-cases;
- ③ a manufacturer of automobile washing equipment.

Ten of the eleven firms were Canadian-owned, and four were actually Canadian-owned multinational corporations. Six had overseas operations, although sometimes these off-shore facilities amounted to little more than a sales office and warehouse. Four of the firms had multiple production locations in Canada (Table 1).

All of the firms exported some of their Canadian production, and all but two exported more than half of their production (Table 1). The mean export percent (export as % of sales) was 56.8%. The U.S. was the dominant export market in the sample, with all but one firm citing the U.S. as a customer. In nine firms, the U.S. was the major export market. Exports to the EEC, Australia and the third world were also important for half the sample.

The majority of firms did their own export marketing: seven out of 11 handled their own export sales exclusively (or almost exclusively); two relied totally or mostly on agents or distributors; and another two relied jointly on their own operation and middlemen for export sales. Nine of the firms considered themselves to be "active exporters", as opposed to passive or "laissez-faire".

Most of the firms have yet to adopt the "modern marketing concept" when it comes to international marketing. Several questions were posed to gain a profile of their degree of market orientation (Table 2). The average firm was about neutral to slightly positive on the following dimensions:

- ④ firms focussed moderately more on increasing customer satisfaction (versus increasing sales volume).

TABLE 2

MARKET ORIENTATION MEASURES

	SCORE OF *			
	Mean Score	1 or 2	3	4 or 5
Approach To Attaining Profits: Increasing Sales Value (1) ** versus Increasing Customer Satisfaction (5).	3.36	2	5	4
Main Concern: Customer Needs (1) versus Selling Products Overseas (5)	2.45	4	7	0
Overseas Market Research: Not Important (1) versus Very Important (5)	3.09	4	3	4

* All dimensions measured on a five point 1-5 scale.

** Five point "anchored" scales: 1= totally focussed on increasing sales volume;
5 = focus entirely on increasing customer satisfaction.

- ⑥ firms focussed moderately more on customer needs (versus on selling products overseas).
- ⑥ firms were almost neutral on the importance of overseas marketing research.

What was perhaps disturbing in these results was that although most firms "claimed" to be moderately market oriented (first two scales above), the presence or importance of market research was sadly lacking for most; that is, "good intentions, but no action". Only four firms thought marketing research to be important to their overseas marketing efforts, a negative finding, particular in view of the key role that market research and intelligence plays in most U.S. better practice market-oriented firms.

Many of the firms appeared to have a "world focus" when it came to their product line. More than half the companies produced a product for international markets with adaptation to local needs:

	<u>Number Of Firms *</u>
Sold same product lines domestically and abroad.	4
Sold a limited version of the domestic line abroad.	1
Sold an expanded version of the domestic line abroad.	1
Sold same product worldwide, adapted to local needs.	6

Five firms still had a "produce for Canada, export later" orientation.

The companies in the sample are in no way intended to represent Canadian manufacturers in general. Rather they represent the "best" in terms of design and export. The superb export performance - an average

* adds to more than 11 due to multiple response for one firm with different classes of product lines.

of about 60% export business - cannot be denied. But the orientation of these firms to international marketing - their lack of a 100% commitment to customer satisfaction, to customer needs, to overseas market research, and to producing products for world markets - does provide cause for concern, especially when one considers that the typical Canadian firm is far worse than this "better practice" sample.

Industrial Design Resources And Their Allocation

The firms in the sample, as expected, devoted a considerable amount of resources - money and manpower - to industrial design. But the question of "how much is spent on industrial design" proved to be a difficult one. Most firms in the sample did not differentiate well between industrial design and engineering design; and a few had great difficulty separating new product development from design. As a result, the dollar, manpower and percent figures cited below for resources spent on industrial design probably overstate the real situation.

The numbers and types of people involved in design was a concern of this investigation. The "average" firm employed a total of 7.49 people³³ on industrial design, while 8.11 people were employed per \$10 million sales. (The \$10 million sales denominator was used to adjust these manpower figures for size of firm). Table 3 provides a breakdown of manpower - average and per \$10 million sales - by type of person and whether full or part-time (converted to full-time equivalent). In addition, firms and design consultants³⁴ were asked to provide a breakdown of the proportion of design work done by each type of person (also reported in Table 3).

The data reveal the following about the manpower employed in industrial design (Table 3):

- ① Of the 8.11 equivalent people employed (per \$10 million sales), almost exactly two-thirds are working full-time on the design function.
- ① Engineers were the largest single group working in "industrial design" in the firms, representing 43% of the manpower input.

33. Heavily weighted to the large firm.

34. For their clients.

TABLE 3

MANPOWER AND WORK BREAKDOWN
IN INDUSTRIAL DESIGN

Type Of Employee	Average For The 11 Firms*		Per \$10 Million Sales		Companies: Design Work Breakdown	Consultants Views: Design Work Breakdwn
	Equivalent No. Of People	% Split	Equivalent No. Of People	% Split		
Industrial Designers	0.76	1.02%	0.67	8.3%	13.0%	1.3%
Engineers	2.36	31.6	3.52	43.4	33.0	35.0
Draftsmen	3.42	45.7	1.94	24.0	16.5	16.3
Managers	0.62	8.3	1.78	22.0	22.3	12.5
Marketing	0.21	2.8	0.14	1.7	12.7	33.8
Stylists	0.09	1.2	0.00	0.0	0.0	0.0
Other	0.02	0.3	0.05	0.6	2.5	1.3
Total	7.49	100.0%	8.11	100.0%	100.0%	100.0%
Part Time**	6.45	86.1%	5.51	68.0%	----	----
Full Time	1.04	13.9%	2.59	32.0%		

* The "employees per \$10 million sales" was computed in order to take into account that size of the company is related to number of employees. Thus, this common denominator of \$10 million sales provides a base, and is a more useful figure than the "average company".

** Expressed as full time equivalent, i.e., number of people multiplied by the percent of time working on industrial design.

- ④ Draftsmen and managers were the next largest groups representing 24% and 22% of the manpower input.
- ④ These three groups - engineers, draftsmen and managers - accounted for almost 90% of the industrial design manpower in the sample.
- ④ Industrial designers themselves were noticable for their absence from the industrial design function in these "better practice" firms. They represented only 8.3% of the manpower input.
- ④ Engineers and draftsmen were, for the most part, full time designers; managers were involved in the design function on a part-time basis (but full-time equivalents were estimated).

The results for the output of the design efforts - what proportion of the design effort was done by each group - paints a similar picture (last two columns, Table 3). Once again, engineers predominate, accounting for 33% of the design work; managers were seen to account for 22.3% of the work, with draftsmen dropping to 16.3%. Somewhat of a surprise was the fact that marketing personnel accounted for almost as much of the design effort (12.7%) as did draftsmen. Once again, industrial designers played a surprisingly minor role (13%). Industrial design consultants gave strikingly similar breakdowns for their clients, except that marketing people handled much more (33.8%), while in-house company designers did little.³⁵

Six of the 11 firms had formally established industrial design departments, with an average staff of 7.0 people per department. But these design departments were heavily engineering oriented. Of the eight firms that had design groups (six formal, two informal), six indicated that the staff was comprised of mechanical and/or electrical engineers, or engineering technicians. Only one firm in the sample employed a professional industrial

35. Which might explain why the firm hired an industrial design consultant in the first place.

designer as opposed to an engineer or equivalent; another firm employed an interior designer.

Most firms spent a considerable amount of money on industrial design (more correctly, "on design", since firms really could not distinguish between engineering and industrial design). The average spent was \$433,500 annually, which was 4.1% of sales. Just over half of firms saw this figure increasing in the next five years, while five firms indicated they would be spending no more on industrial design in 1984 than they did this year. Overall, the expected ratio of spending on design five years from now was 1.46 times. Industrial design consultants were more optimistic, expecting design expenditures to more than double in five years (2.46 times).

Overall the companies had a reluctance to seek design help from outside (with the exception of the new firm). On a zero to seven scale (0=never; 7=all the time), the mean tendency to use outside design firms was 2.45. Firms spent an average of 8.1% of their design expenditures on outside design consultants (excluding the new firm), with the average outside expenditure representing \$18,500 annually or 0.31% of sales.

This brief review of the amount and nature of resources spent by better practice firms on industrial design provides some surprising conclusions:

- Most firms do not have a clear idea of what industrial design is. The term "design" includes both engineering and industrial design, with few efforts to distinguish the two.
- As a result, industrial design is dominated by a strong engineering orientation (so much so that what was called industrial design probably isn't!). The nature of the personnel employed and the percent split of the design effort points to an engineering focus.
- There is an almost total absence of professional industrial designers, even in these better practice firms.

- A considerable expenditure is made for the firm's design effort in the case of these better practice firms. Design departments were common; manpower allocation was substantial (8.11 people per \$10 million sales); and financial resources allocated appeared generous (4.1 % of sales).
- Firms appeared reluctant to use outside professional design consultants.

In short, the total design effort - its magnitude - of these firms seems more than adequate.³⁶ What appears deficient is the direction or orientation of this design effort: almost totally an engineering design focus. The confusion about what industrial design is together with a reluctance to seek outside help only adds to the problems.

36. Although their spending is probably well above the national average.

Role And Focus Of Design

In this section, the concern is on where industrial design "fits in" with other organizational activities, and what part design plays.

The firm managers, consultants, and trade commissioners were first questioned about what design is used for in the firm: for example....

- whether the focus is on new product versus the redesign of existing ones;
- whether the focus is on style versus function; and
- whether the design concern is with the product only or the extended product, including package, brochures, displays, logo, etc.

The replies were not surprising (Table 4). The design effort in firms appears to lean more towards new products than redesign of existing ones (6.45 out of 10, where 10 = new products; 0 = redesign); consultants gave a very similar reply (6.50 out of 10). The focus for the firms is almost entirely on "function" and rarely towards the "style" end of the scale (8.09 out of 10, 10 = function); consultants and trade commissioners thought that firms were marginally more concerned with style (7.5 and 7.75 out of 10). The focus of firms is on the product only (3.75 out of 10 where 10 = extended entity); here trade commissioners concurred, but consultants disagreed: they thought firms, at least their clients, to be concerned about the whole bundle of design elements, not just product (7.5 out of 10).

An indication of the design spectrum and the particular focus of firms in the sample is shown in Figure 4. As might be expected, the performance-oriented products such as machine tools, automation equipment and sailboats, witnessed a strong product function orientation in design. Nearer the other end of the spectrum were products where appearance would logically be more

TABLE 4
FOCUS AND ROLE OF INDUSTRIAL DESIGN

Question Or Measure	Mean Scores: 0 to 10 Scales		
	Firms' Replies	Trade Commissioners' Replies	Consultants' Replies
Focus Of Design: On new products (10) versus on redesign of existing products (0)	6.45	No Opinion	6.50
Focus Of Design: On product function and operation (10) versus on style (0)	8.09	7.75	7.5
Focus Of Design: On the extended product (packaging, logo, brochures, etc.) (10) versus product only (0)	3.73	4.50	7.5
Importance of design to new product process (10=very; 0=not)			
For Own Firms (or clients)	8.70	Not Applicable	7.75
For Other Firms	5.90	3.75	4.25
Amount of time and effort devoted to design (10=a great deal; 0= little)			
For Own Firms (or clients)	8.40	Not Applicable	7.75
For Other Firms	5.90	3.50	7.75
Involvement of top management in Design (10=a great deal; 0=does not)			
For Own Firms (or clients)	8.10	Not Applicable	8.75
For Other Firms	6.10	6.00	5.75

FIGURE 4

FOCUS OF DESIGN (AS RATED BY THE MANAGERS OF THE 11 FIRMS)

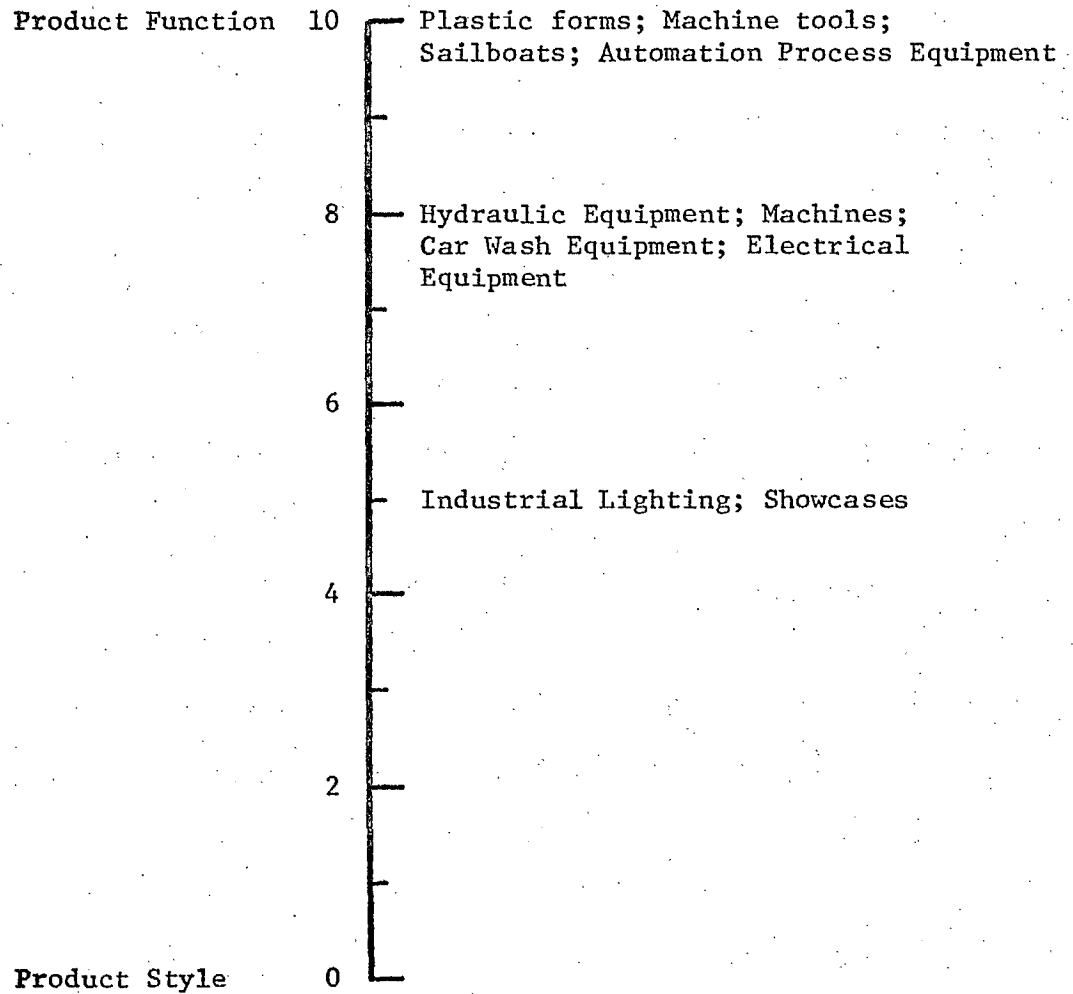


Figure 4 - The design spectrum and focus of design in the sample of firms.

important: showcases and lighting fixtures. Thus the focus of the design effort is determined largely by the nature of the product class (See Figure 1).

Regardless of the focus, most respondents thought that industrial design played a key role in the totality of their own enterprises (or their clients). They were less enthusiastic about design's role in other companies (Table 4). The 11 companies rated the importance of design in their own new product process as 8.70 out of 10, where 10 means "very important". Ratings were consistently high here. Surprisingly, design consultants rated design's importance in their clients' new product process a little lower (7.75). But all the respondents - firms, trade commissioners and consultants - thought that the role of industrial design was much less important in other firms (5.9 out of 10 for firms; 3.75 for trade commissioners; and 4.25 for consultants).

Again there seemed to be near-unanimity in regards to the perceived effort put into design and also the involvement of top management in design. Firms thought they put in a "great deal of time and effort" into industrial design (8.4 out of 10); but that their competitors did less (5.9 out of 10). Firms were also fairly convinced that industrial design "involved top management a great deal" (8.1 out of 10), but again less in the case of the industry at large (6.1 out of 10). Consultants and trade commissioners gave very similar responses to the above.

When questioned about the position of the industrial design group or department in the organizational structure, again a similar pattern of replies emerged (Table 5). In the case of their own firms (or their clients), design was inevitably at an equal or superior level to other functions, such as Engineering or Marketing. For example, four firms said design was at the top management level in their firms; another three said it was separate from, but equal to the Marketing and Engineering groups.

TABLE 5
ORGANIZATIONAL LOCATION OF THE DESIGN GROUP

Location of Design	Firms' own Cases	Consultants' Clients	Industry in General
Ancillary	0*	0*	3*
Subordinate to R&D/ Engineering	3	1	4
Subordinate to Marketing	1	1	4
Separate but equal to Marketing or Engineering	3	1	3
A Leading Position	0	3	1
A Top Management Position	4	1	3
Total Responses	11	7	18

* number of times mentioned..multiple responses are possible.

Three said it was subordinate to Engineering/R&D, and one subordinate to Marketing. A similar picture was painted for the clients of design consultants: the design function is most often at a leading position in the company.

The picture changed dramatically when respondents were asked to describe the organizational location of design for Canadian industry in general. Here in 11 cases out of 18,³⁷ design was thought to be in an ancillary position, or subordinate to Marketing or Engineering. Only four times was design thought to be in a leading or top management position.

The role that design played as part of the new product process was also determined. Here managers and consultants were shown a typical and idealized flowchart of the new product process (see Figure 3 in Part I). They were asked to modify this diagram to reflect their own (or their clients') process. Surprisingly, all respondents were content to let the idealized flow chart represent their actual situation: in most cases, the model in Figure 3 appeared close enough to the average or typical new product case. Next, respondents were asked to indicate where industrial design took place in the process: that is, what proportion of each activity involved industrial design. The results are shown in Figure 5, with the height of the shaded areas of each stage representing the proportion of design effort.

What is most revealing about this analysis is the prevalence of design work throughout most of the new product process. Design and designers are certainly not limited to one or a few stages in the process. Rather, as suggested in Part I, industrial design is a pervasive activity, much like "planning" or "decision-making".

The most design-dominated activity is the product development stage -

37. Some respondents gave multiple replies.

FIGURE 5

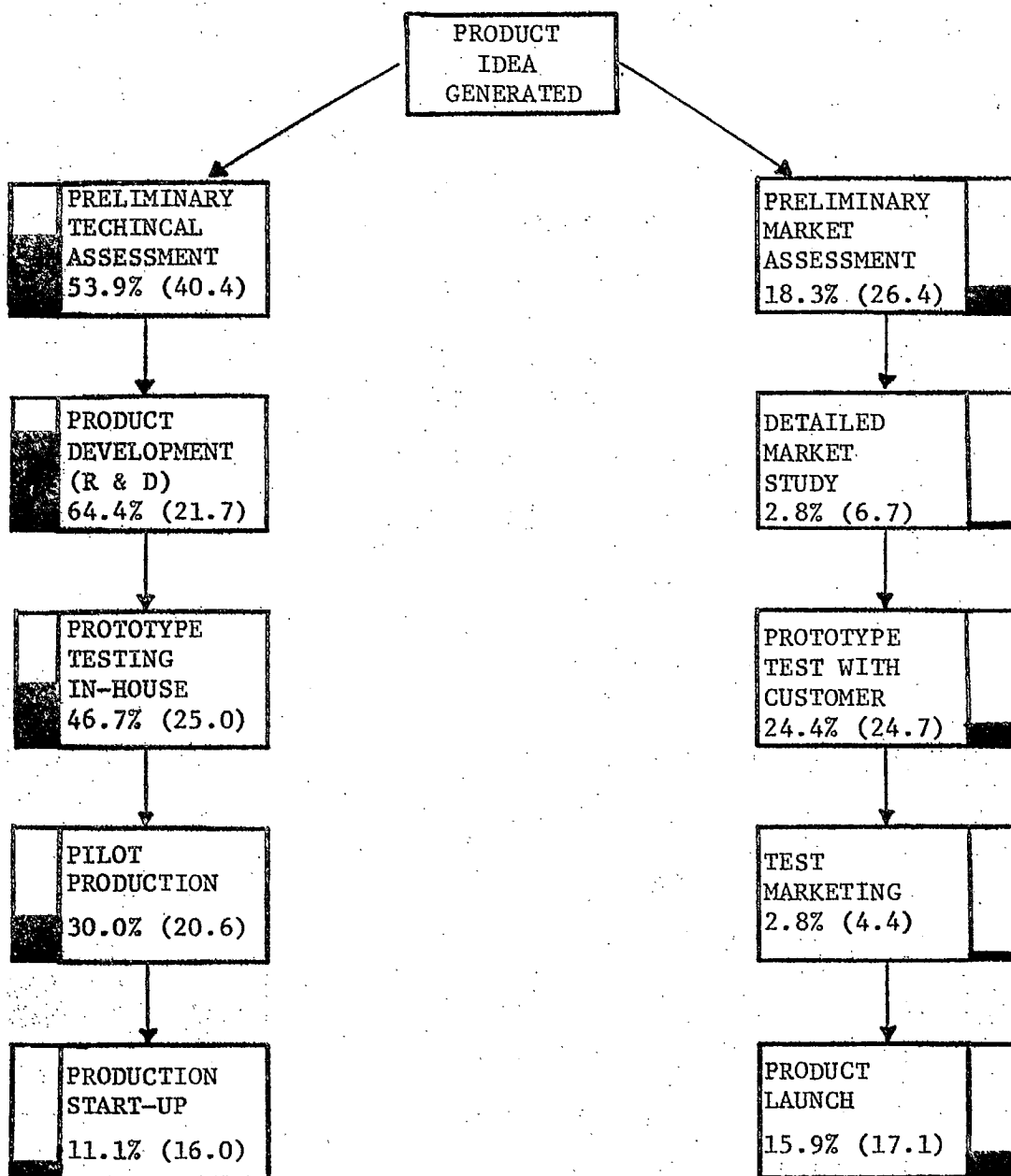


Figure 5: The proportion of design in each stage of the new product process. The shaded area represents design work as a % of that stage (also shown as a %) while the number in parentheses gives the standard deviation of this percent.

where the product is moved out of a technical feasibility analysis to an actual product design. Almost 2/3 of this stage is industrial design.³⁸ The next most important design stages are Preliminary Technical Assessment (54% of design) and Prototype Testing-In House (47% design). Industrial design, as expected, played a relatively small role in the market-oriented activities. These stages are largely information seeking ones, hence logically involve little design (the exception being Prototype Testing With Customer - 24% design). The design consultants gave a fairly similar breakdown of design across those new product process activities (not shown). The most noticeable difference was the market launch: here the designer's clients involved much more design work (40%), reflecting the design consultants' proper concern with the whole design - product, package, brochures, logo etc - and not just with the product.

A final finding from this analysis of the stage-wise model is the great variation in emphasis on design at the various stages between the firms. In all but a few stages, the standard deviation, a measure of variance, approached or exceeded the mean value of the design percent, indicating a great dispersion of results. For example, in the product development stage, industrial design represents 90% of this development stage for the company manufacturing showcases, but only 60% for the car wash equipment firm. To speak about the "average firm's new product design process" becomes meaningless, as the likelihood of any one firm being "average" is small indeed. It must be remembered that the design emphasis at each stage of the new product process is, and should be, very much a function of the type of product.

38. Again respondents tended to lump both engineering and industrial design together.

The conclusions from this section on the role and focus on industrial design include:

- Industrial design is focussed somewhat more so on design of new products than the redesign of existing ones.
- Industrial design is aimed strongly at product function, and not at style.
- Industrial design focusses on product, and not the whole design entity (except for the design consultants and their clients).
- For firms and consultants' clients, industrial design is a particularly important part of the new product process, involves much time and effort, and generally involves top management.
- For industry at large, the same was not true. A lesser importance, time and effort and top management involvement was accorded industrial design.
- The industrial design group was generally located at an equal or leading point in the firms studied or in clients of consultants, but accorded a more subservient position in most other firms.
- Industrial design was a pervasive activity throughout the entire new product process. It was not a single stage in the process, and there existed considerable difference in the emphasis at any one stage between firms. Design emphasis at each stage is very much a function of the nature of the product.

Once again, confusion regarding what design is, and the great difficulty both managers and design consultants had in separating industrial from engineering design, is apparent in the results of this section. Further, the results from this section strongly suggest that these better practice firms (and the clients of the consultants) are achieving a fairly creditable design performance: design plays a significant, important and visible role. But the picture for industry in general is quite the reverse. Indeed the evidence points to industrial design as a subservient and marginally visible activity in most firms.

The Strategic Impact Of Industrial Design

Industrial design is intended to improve the marketability of a product through improved product design. Just how important good product design is to generating sales is the topic of this section.

The sales of a product depend on the elements of the marketing mix (see Figure 2 in Part I). Where product design rates as an element of the mix was determined by asking respondents to rank ten different elements (price, salesforce, product design, etc.) in order of their importance to generating sales. Also, respondents were asked to rate the importance of each element (0 to 10; 10 = very important, 0 = not important). The impact on domestic sales was measured first (Table 6).

Product design stood out as the dominant element of the mix in terms of its impact on domestic sales. It was ranked first by five of the firms, compared to price which was scored first only once. The mean ranking of product design was 1.82, and its mean importance was 8.64 out of a possible 10. Product Design was thought considerably more important than Distribution Channels (score of 6.09) and Price (6.00), the next most important elements.

After Product Design came Distribution Channels, Price and Salesforce, all virtually tied in rank in respect to their impact on domestic sales. The importance ratings showed six elements to be essentially tied - these three plus Service, Availability and Promotion.

The three least important elements of the marketing mix, in ascending order were Packaging, Advertising and Guarantee. The importance of Packaging was thought to be a meager 2.63 out of 10.

The design consultants generally gave similar rankings (Table 6), except that Distribution was scored much lower and Advertising somewhat higher. Again Product Design dominated as the critical variable (but surprisingly, not as much so as with the firms themselves).

TABLE 6
IMPORTANCE OF ELEMENTS OF THE
MARKETING MIX ON DOMESTIC SALES

Element Of The Marketing Mix (in order of importance *)	FIRMS' REPLIES			Consultant's Ranking
	Mean Rank	Rank Order	Mean 0-10 Rating	
Product Design	1.82	1	8.64	1
Distribution And Channels	4.09	2	6.09	6 †
Price	4.27	3	6.00	2
Salesforce	4.36	4	6.54	4
Service	5.00	5	6.82	
Availability; Shipping Speed	5.91	6	6.91	7
Promotion	6.00	7	6.36	
Guarantee or Warantee	6.64	8	5.91	
Advertising	7.27	9	4.36	5 †
Packaging	9.18	10	2.63	8
				2**(Technology)

* As indicated by firms' rank ordering.
Parenthesis indicate elements essentially the same importance.

** Consultants were given a modified list of elements.

Firms and consultants were then asked to indicate the importance of product design or redesign to the firm (or its clients) and to other firms. The results were:

- On average, firms believed industrial design to be very important to the sales of their new products in Canada (8.1 out of 10).
- Consultants were even more enthusiastic, rating design's importance to new product sales at 8.75 out of 10.
- The impact of redesign on the sales of existing products was not quite as great: 6.67 out of 10 for firms and 6.26 for consultants.
- Firms rated the impact of design for new products much lower for their competitors (7.2) than for themselves; and similarly redesign for existing products was lower (5.40) for other firms.

The impact of product design on export sales was sought next. First, product policies with respect to international markets were determined for the firms and industry in general. Different modes or philosophies of product design vis-a-vis export markets were outlined, and the respondent picked the mode which best described his firm. The results are presented in Table 7. Overall, most firms were international in their new product design outlook: they designed a new product for the Canadian market, but a product which could be easily adapted to world markets (6 firms); or they designed for the world market and adapted the product to meet local needs (3 firms). Consultants thought their clients behaved much the same way.

The story was much different for Canadian industry at large. Combining firm's views on their competitors with trade commissioners' opinions on industry in general revealed that:

- Most thought Canadian firms designed a product strictly for the Canadian market, and later tried to sell it abroad with no changes (8 replies).
- Alternatively, some thought Canadian firms designed a product for Canada, and later adjusted it to sell abroad (5 replies).

TABLE 7

PRODUCT DESIGN AND EXPORT MARKETS:
MODE OF ADAPTATION

	Mode of Adaptation To International Markets	Number of Responses		
		Firms' Own Operations	Consultants' Clients	Industry in General
<div> <div>Home</div> <div>↑</div> <div>Orientation</div> <div>↓</div> <div>Inter-national</div> </div>	The firm designs and manufactures a product for the home market, and later tries to sell it abroad virtually unchanged	0	1	8
	The firm designs and manufactures for the home market, and later adjusts the product to sell it abroad	2	0	5
	The firm designs and manufactures a product for the home market, but with export sales in mind, so that needed major adaption is easily made.	6	1	1
	The firm designs a product for world markets, and adapts it to local needs	3	2	0

- 0 Only one respondent thought Canadian initially designed a product with world markets in mind.

Thus a mypopic or "home market" orientation describing Canadian firm's design practices emerges in this analysis.

The strategic impact of Product Design as an element of the marketing mix was determined for firms' export sales. Again Product Design stood out as the critical variable in deciding the firm's export performance (Table 8). Four firms ranked Product Design first, and its rated importance climbed to 8.91 out of 10.

The remaining elements of the marketing mix stayed in approximately the same order as they had for domestic markets. Distribution went up in importance as did price. But the relative positions stayed essentially the same: Product Design a clear first, followed by Distribution, Price and Salesforce.

The same rating and ranking responses were sought from trading houses, consultants and trade commissioners. Here the results differed markedly from the views of the better practice firms (Table 8). Trade commissioners had the most divergent opinions, rating Service first, and Promotion tied with Price second. None of the other respondents - firms, consultants or trading houses - rated service and promotion highly. (The message could be that trade commissioners are either more insightful than most, or are simply out of touch with the realities of business).³⁹ Trade commissioners and trading houses both tended to downplay the importance of product design (5th and 4th place respectively), while consultants agreed with the firms on the leading position of product design. Trading houses thought Price, Salesforce and Availability to be the key variables, a view that is probably typical of middleman operations.

39. Although this low rating could also reflect the fact that Canadian design generates little in the way of export sales.

TABLE 8

IMPORTANCE OF ELEMENTS OF THE
MARKETING MIX ON EXPORT SALES

Element of the Marketing Mix	Firms			Trade Commissioners		Trading Houses		Consultants	
	Mean Rank	Ranking	Rating (0-10)	Ranking	Rating (0-10)	Ranking	Rating (0-10)	Ranking	Rating (0-10)
Product Design	2.45	1	8.91	5	7.25	4	6.5	1	8.75
Distribution & Channels	{ 3.45	2	7.72	6	5.75	10	0.5	5	6.00
Price	{ 3.85	3	{ 6.91	2	7.00	1	9.0	3	7.00
Salesforce	4.55	4	6.64	4	7.50	2	8.0	4	7.50
Service	5.09	5	6.55	1	8.50	6	4.5		
Availability & Shipping Speed	{ 6.09	6	{ 5.90	2	8.30	8	4.5		
Promotion	{ 6.36	7	6.64	8	6.50	3	8.0	6	7.00
Garantee/Warranty	{ 6.64	8	{ 6.09	7	7.50	5	6.5		
Advertising	7.73	9	3.73	10	5.30	8	4.0	7	5.00
Packaging	8.64	10	3.18	9	6.30	7	5.0	8	5.75
								2*	7.00

- 49 -

Parentheses indicate elements essentially the same importance

* Consultants were given a modified list of elements

The importance of industrial design to generating export sales of new products was measured (Table 9). Consultants and companies both rated industrial design as very important, with respective mean scores of 9.0 and 8.45 out of 10. Trade commissioners disagreed, rating design's importance in new product export sales as only 4.50. Ratings were also moderately low (6.55 out of 10) for firms' Canadian competitors.

The importance of industrial redesign of existing products for export sales was also thought fairly important by both firms and consultants, although less so than for design in new products (scores were 7.00 and 6.25 out of 10). Again trade commissioners rated the importance of design low (4.50). Finally the importance of redesign to other firms was rated as marginally important (6.09). Four of the 11 firms, all of the design consultants and none of the trade commissioners thought industrial design to be more critical for export sales than for domestic sales. Design consultants generally thought design competitiveness and proficiency to be greater abroad; most firms thought design to be equally vital to both domestic and export markets; while trade commissioners did not think industrial design to be critical in either domestic or foreign markets.

One last question attempted to gauge the overall reaction of respondents to the potential role of industrial design:

Agree/Disagree: "Industrial design is the key to the firm developing potential export business."

And here there was a fairly strong consensus of opinion. Firms, consultants and trade commissioners generally agreed that industrial design could potentially open export markets, and is a key to future strategies (scores of 7.91, 8.25 and 7.25 out of 10, respectively; 10 = strongly agree).

This section has attempted to quantify the importance of industrial design to generating export sales. A comparison with other elements of the marketing mix and with its role in domestic markets helps to position industrial

TABEL 9

IMPORTANCE OF INDUSTRIAL DESIGN
TO EXPORT SALES

Measure	Company's Own Operations	Company's Rating of Industry	Consultants (for their clients)	Trade Commis- sioners
Importance of industrial design to new product export sales (10=very; 0=Not)	8.45*	6.55	9.00	4.50
Importance of industrial design to export sales of existing products (10=very; 0=not)	7.00	6.09	6.25	4.50
Industrial design is the key to developing exports (10=strongly agree; 0=strongly disagree)	7.91	-	8.25	7.25
Industrial design more important for exports than for domestic sales?	4 Yes 7 No	-	All Yes	All No

* mean score out of 10

design in perspective. Some of the major conclusions are:

- 0 There remains little doubt that firms (certainly those better practice firms) and design consultants believe industrial design is the most critical element of the marketing mix for both domestic and export sales. Design was ranked first, well above other elements such as Distribution, Price and Salesforce.
- 0 Trade commissioners and trading houses did not share the same views on the key nature of industrial design. What they saw as important tended to reflect very much their own role in the export marketing process, and their experience with Canadian goods.
- 0 Industrial design is more important for new products (both domestic sales and export) than for redesign of existing ones.
- 0 Industry at large probably sees industrial design as much less important than do these better practice firms.

Overall, the message from this section points to the great potential of industrial design in creating export sales. A handful of better practice firms, who are far from representative of Canadian manufacturers, openly admit to industrial design being the critical factor in their export successes. These few companies appear to have "seen the light" and wholeheartedly endorse industrial design as the strategic variable. These Canadian firms have discovered what so many other firms around the world have known for generations. What is particularly disturbing is that these firms represent the minority: that industry in general, and other involved in Canadian export marketing, have yet to realize and acknowledge the great potential of effective industrial design.

Support For Industrial Design

One of the potential problems with industrial design in Canada may be the lack of outside support. As a result, the firms were questioned as to the level and appropriateness of outside help: government, consultants, institutes, etc.

A review of resources allocated (previous sections) showed a great reluctance of firms to turn to outsiders. Their assessment of outside help helps to explain this reluctance:

- Nine out of 11 firms had used some form of government support; similarly three of the consultants had.
- Support programs, in terms of use popularity, were: IRDIA, PAIT, and IDAP.
- Firms rated these programs, on average, moderately positively (6.77/10, where 10 = excellent; 0 = poor).
- Consultants were more positive: 7.66 out of 10.

Government programs were not seen as the major problem. Indeed there were many positive comments about these, and a few suggestions for improvement (provided later).

The major criticism of outside help was directed at the industrial design profession itself. Nine of the 11 firms had hired outside designers and design consultants to handle a variety of jobs including appearance and styling, total design, architectural design, etc. Overall the ratings were less than enthusiastic (4.67 out of 10). Comments on specific designers were frequent, and consistently negative:

"He did an unprofessional job"

"Overpriced and overpaid"

"Not enough experience"

"Cost and time overruns...by a factor of 10!"

"Too narrow an outlook on design"

"Too concerned with aesthetics; not very practical"

The message here is that the great reluctance to make more use of outside designers is not because the firms are unaware of design, but because they perceive the designers to be inefficient and ineffective.

Only two firms had sent their personnel to design or related courses. Four of the firms had turned to institutes for design help, mostly for engineering tests at universities.

The major conclusion from this section is not that government programs to industry are hopelessly inadequate (certainly there is always room for improvement), but that the industrial design profession itself may be the culprit. The opinion held by these better practice firms on outside designers was surprisingly negative.

Canada's Position Versus The World

An important facet of the study was to gauge Canada's strengths in export marketing versus those of its international competitors, with a particular focus on industrial design capabilities. First, the trade commissioners, consultants and trading houses were asked to rate Canada's competences against foreign competition. Results are provided in Table 10. Eight areas were investigated; and Canada was thought to fare poorer than its competition in all of them. The strongest area was Price Competitiveness, largely due to the devalued Canadian dollar. The next best was Product Availability. The weakest areas for Canada were Advertising (2.27 out of 10); Product Design (2.63) and Distribution (2.82). The extremely dismal rating for Canada on these latter areas suggest some of the problems and difficulties Canada faces in export marketing.

Importance to export effectiveness (as reported earlier in this report) are also noted in Table 10. Product Design, Distribution and Price are the key variables for export marketing. What is particularly disturbing is that it was the two most important elements for effective exporting, namely Product Design and Distribution⁴⁰, where Canada was perceived to be weakest.

A number of unsolicited comments were made regarding Canada's export performance and international competitiveness. These are summarized in Table 11. Generally the comments are familiar ones: lack of aggressiveness; lack of pride; foreign ownership; small economic base; and lack of support.

Canada's design proficiency was next compared to design in other countries. All the respondents were asked to cite the three leading design countries in the world, and the best designed products of the world. The consultants, although interviewed separately, were unanimous. All four gave equal and top ratings to the U.S., West Germany and Italy. Japan was not

40. As rated by the firms, previous section.

TABLE 10
CANADA'S EXPORT STRENGTHS*
VERSUS ITS COMPETITORS

	Canada's Competition Strength: Rank Order	Mean Rating 10=Far Stronger 0 =Far Weaker	Importance** to Export Sales
Price	1	4.90	Very Important
Availability	2	4.18	Fairly Important
Packaging	3	3.63	Not Too Important
Technology	4	3.45	Fairly Important
Salesforce	4 } tied	3.45	Fairly Important
Distribution	6	2.82	Very Important
Product Design	7	2.63	Critical Importance
Advertising	8	2.27	Not Too Important

* as seen by trade commissioners, consultants, trade houses (N=11)

*** as rated (previously) by firms.

TABLE 11

COMMENTS ON CANADA'S WEAK EXPORT POSITION

- Canada is not aggressive enough in overseas markets.
- Canadians are not aggressively export oriented.
- There is a lack of pride in Canada: no national unity.
- No team spirit!
- Our prices are too high.
- Most Canadian firms are too conservative (vis-a-vis exports).
- We are content to sell in our own markets.
- We are not interested in growth.
- There is little support for export marketing activities.
- Industrial design is only one facet to improve exports; the rest are also missing!
- Our industrial base is too small.
- Our small population, harsh climate and abundance of raw materials.
- Too many foreign-owned firms in Canada.
- No market intelligence of overseas markets.
- No venture capital here.

And finally, a frank admonition from the only company in the sample with few export sales:

"The [Canadian] government wanted me to export, and I was 'sucked in'. We weren't successful, and now this export business is taking up too much of my time!"

cited. Trading houses identified Japan and Germany, while trade commissioners placed Japan in first place, followed by Germany, Denmark and the U.S. The eleven firms ranked the countries as follows:

	<u>Times Mentioned</u>
U.S.	8
Japan	7
Germany	6
Italy	3
Sweden & Norway	4

No one mentioned Canada as a "good design" country.

A variety of products were identified as being well designed (from these countries) including: consumer electronics; furniture; machine tools; cameras; clothing; cars and motorcycles; office machines and computers.

Several questions were posed regarding the best design countries, and Canada's position relative to the best. Canada faired poorly, and was rated a meager 3.20 out of 10 by consultants, trade commissioners and trading houses (where 10 = best design country). There was general consensus on Canada's poor position. Finally respondents were presented with a list of eight countries, and asked to rank order them in terms of best design to worst design. The mean rankings by trade commissioners and firms were:

	<u>Firms</u>	<u>Trade Commissioners</u>
BEST	U.S.	West Germany
	West Germany	U.S.
	Italy	Denmark
	France	France
	Great Britain	Italy
	Denmark	Great Britain
	Canada	Canada
WORST	Nigeria	Nigeria

The two best were clearly the U.S. and Germany, and by a considerably margin. (The U.S. position was largely due to mass-produced products).

Nigeria was unanimously ranked last (as anchor-point or end-point for comparison) and Canada was consistently ranked just above Nigeria. Once again, the dismal state of design in Canada was illustrated.

The importance of industrial design to the sales performance of these better design countries was also measured (results are in Table 12). Here, trade commissioners, consultants and trading houses (taken together) believed that industrial design was particularly crucial to the export performance of these countries (9.0 out of 10, where 10 = very important) and that design was somewhat less important to their domestic sales (7.2 out of 10). Further, the importance of industrial design to new product development was determined for these better practice countries (Table 12).

- Industrial design was thought to be very important to new product development (7.8 out of 10).
- Industrial design was perceived to involve a great deal of time and effort (8.1 out of 10)
- Industrial design, it was thought, involved top management to a considerable extent (7.5 out of 10).

The responses to these importance questions (Table 12) can be compared to the replies for Canadian industrial design. Although the results are not directly comparable (different groups of respondents), the available evidence strongly suggests industrial design is perceived to be a far more important strategic variable in these better practice countries.

The question of why industrial design is so lacking in Canada was also considered. A number of frank and general replies were given (Table 13), and also some specific reasons:

- There was a feeling⁴¹ that there was a much greater design awareness in these good design countries than in Canada (7.3 out of 10, where 10 = much more awareness; 0 = same).

41. Responses of trading houses, commissioners and consultants, together.

TABLE 12

IMPORTANCE AND NEW PRODUCT ROLE
OF INDUSTRIAL DESIGN IN
BETTER PRACTICE COUNTRIES

Measure	Other Countries*	Canadian** Industry at Large
Importance of Design in:		
Generating Export Sales	9.0	5.83
Generating Domestic Sales	7.2	6.30
(0=Not Too Important; 10=Very Important)		
Importance of Industrial Design to New Product Process		
Importance (10=Very; 0=Not Too)	7.8	5.05
Time and Effort (10=Great Deal; 0=Little)	8.1	4.94
Top Management Involvement (10=Great Deal; 0=Does Not Involve)	7.5	6.00

* As rated by trade commissioners, trading houses, and consultants.

** Reported in a previous section: firms only for the first two measures;
firms and trade commissioners together
for the last three.

- Relatively few respondents had an opinion about government support programs in these countries. Those that did felt they were marginally better than Canada's (6.0 out of 10, 10 = much better; 0 = poorer).
- Respondents felt that customers in these better countries were only marginally more design-conscious than in Canada (4.9 out of 10, 10 = much more; 0 = same).

Thus, other than a "greater awareness" of design, there were no dramatic reasons for good design abroad. A number of the general comments also provided an insight into what ails Canadian design versus the world (Table 13 summarizes these comments). The main thoughts were:

1. Tradition: a lack of tradition, history and experience of design in Canada; low awareness and low felt need.
2. Market: foreign buyers are more conscious of good design.
3. Government: not enough resources and fragmented programs here; industry is more receptive to programs abroad.
4. Design Profession: professionals and their education, experience, etc. seriously lacking in Canada; low job status; dependence on, and drain to, the U.S.

Respondents were asked for their views on a number of ideas and issues about Canada's design position and its role. These opinions were sought by measuring the level of agreement with each of a number of statements (0 = strongly disagree; 10 = strongly agree). The mean scores for all the respondents were:

<u>Statement</u>	<u>Score</u> (Out of 10)
Canadian industry recognizes industrial design as an integral part of doing business.	3.50
Many companies make definite provisions for industrial design expenditures, personnel, or consultants.	3.50
Besides striving for technical excellence, a company needs a conscious design policy.	7.35

TABLE 13

WHY INDUSTRIAL DESIGN IS LACKING IN CANADA

CULTURAL, HISTORIC, TRADITION COMMENTS

- Canadians have no history and no experience in design.
- We lack the cultural background.
- There is a recognition [abroad] that design sells products.
- The value of industrial design has been proven in those countries.
- The craft tradition in Europe explains the emphasis on design.
- Industrial design is taken for granted in Europe; it just plays a bigger part in the new product process.
- Canada has not created a standard of excellence - felt no need for it!
- Because we export mostly raw materials, there is no great need for good Canadian design.

MARKET DIFFERENCES

- There has been a historical [market] difference over the last 50-60 years.
- Foreign buyers, except the U.S., are more quality conscious buyers, and not just concerned with style.
- Foreign buyers have a different cultural background.
- European buyers have an historical appreciation of good design.
- There is a cultural demand for efficiency (no waste) in design in Europe.

GOVERNMENT ROLE

- Present new product support [in Canada] is fragmented - too many programs, and different ones for each phase.
- Government employees (privy to company information) join competitor firms - can't trust them!
- Canada has not devoted enough financial support to design and R&D.
- Other countries have national industrial strategies, and design is a part of these.
- There is a positive government attitude to design in other countries.
- There is no need for government programs abroad; design is already a way of life.
- The "audience" is more receptive [abroad] to government programs.

THE DESIGN PROFESSION

- Industrial designers are very narrow.
- Industrial design profession is better established abroad.
- Our [company] growth is limited because of a lack of skilled machine operators and design engineers.
- A lack of skilled labor to execute engineering.
- Universities don't consider engineering design too important.
- Educational standards are too low [for designers] ; there is not enough exposure to industrial design.
- The position of the designer is not highly regarded [low status job].

TABLE 13 cont'd

- Good designers are independent: nobody will work with them.
- There is too much design dependence on the U.S.
- Good Canadian designers go to the U.S.
- Canada is perceived as a U.S. brand: there is no unique Canadian design.
- There is a tendency to copy U.S. designs here.
- Designs are often too expensive to produce.

OTHER

- Industrial design has a leadership position in the product development process (in Europe).
- The designer is more involved in new product development all the way through.
- Industrial and engineering design are better integrated [abroad].
- More target marketing in other countries - concentration on a few products e.g., Denmark and furniture.
- Other countries (Japan and Denmark) have been forced to compete via design - not Canada, with our comfortable U.S. market.
- New products and designs developed in Canada are gobbled up by U.S. parents and firms (through licenses).

<u>Statement</u>	<u>Score</u> (out of 10)
Improved design <u>can</u> stimulate exports.	8.35
Industrial design is growing in importance as a factor in international trade.	6.75
There <u>are</u> successful export stories of Canadian firms because of industrial design. But these cases are notable exceptions.	7.55
Unless Canada is prepared to compete with international design standards, we will lose both our export and domestic markets to manufactured goods.	7.95

The replies were quite consistent, and reflect a near-unanimous opinion from the four quite different groups of respondents. The picture that emerges from these agree/disagree statements is again one of the critical importance of design to export marketing, coupled with a fear that Canadian firms and Canadian practice are simply inadequate to meet the international challenge.

Consultants, trade commissioners and trading houses identified those product areas where Canada was competitive (in design) internationally.

In order of frequency of mention, these were:

- O telecommunications equipment.
- O office and industrial furniture.
- O sports equipment; sports wear.
- O fashion goods and clothing.
- O electronics and medical equipment.
- O yachts and sailboats.

Other items, mentioned only once were: snowmobiles and farm equipment.

The recent international successes of Northern Telecom were partly responsible for more than half the respondents mentioning telecommunications products.

What changes, if any, would improve industrial design in Canada? The question was posed, and the ensuing comments and suggestions are categorized into the following groups (Table 14 provides a complete listing):

TABLE 14

SUGGESTIONS FOR DESIGN IMPROVEMENTS

DESIGN PROFESSION

- Initiate an annual competition among designers (with a money prize to the firm).
- Publicize designs that they have been successful with.
- Canadian Designers Association should promote designers more.
- More visibility and accessibility for professional designers.
- Must develop more integrated (full service) design houses - there are too many small, specialized operations.
- Send designers overseas for internship program.
- Start an overseas exchange program for industrial designers - let ours work overseas for a few years.
- Implement an apprenticeship program (to train; to give grads more experience).
- Adopt the (industrial/engineering) design apprenticeship system.

INDUSTRY

- Expose Canadians to design efforts in other countries, e.g., world trade fairs.
- Study methods of successful countries and companies.
- First, must get market knowledge from overseas; then distribution channels; then make product to suit the need.
- Industry should focus on specific industries and markets.
- Must recognize industrial design as a normal part of business activities.
- Must define industrial design separately from engineering design.

EDUCATIONAL INSTITUTIONS

- Universities, technical schools must work closer with industry.
- Establish link between universities, profession and industry.
- Should incorporate notion of industrial design into business schools.
- Stress industrial design (as key to exports) in marketing courses.
- Make industrial design a part of business school curriculum.
- Better design programs in schools.
- More practical technical [design] education is needed.

.../Cont'd

TABLE 14 Cont'd

GOVERNMENT

- More [financial] support for design.
- Government support for design and R&D already high; we don't need more support, but a change in attitude.
- Educate companies instead of subsidizing projects.
- Provide support to industry to hire designers and also to study successful design practice.
- Support programs should be easier to use and of longer term (more than a single project).
- Government program should be redirected to support design efforts of smaller firms with a proven export record.
- Make new product seed money available.
- Need a total program for NPD support - from idea through to launch.
- Government should have a team available for the company - one which helps and stays with company until product (or company) is established.
- Provincial governments should get involved.
- Initiate a product improvement (or redesign) program.
- NPD should be expanded to induce product redesign.
- Subsidies for design and redesign of product.
- Support of tooling needed too!
- Tax breaks for good design.
- Develop industry standards for good design.
- Initiate a promotional program to highlight good design.
- Promote excellence through financial support.
- Set up an industrial design policy.

- Design Profession: more publicity, promotion, visibility, accessibility; better training (apprenticeship system).
- Industry: varied comments, including studying practices in other countries; more internalization of industrial design.
- Education: better links with industry; incorporate industrial design into business schools.
- Government: a wide range of support program suggestions including: a "total" new product scheme; support for re-design; hiring support; consulting team help, etc.

This final section of the investigation reveals some particularly disturbing findings and opinions. On the one hand, it is clear that certain countries are performing admirably when it comes to design. The U.S. and Germany head the list. Not only are these countries known for a variety of well-designed products, but design has significant and important payoffs for the countries. Design was a critical variable in these countries' export performance and plays a key role in their new product efforts.

The picture for Canada is much gloomier. According to this sample of respondents, Canada generally lacks a competitive edge in export marketing. Price is the only variable where we become somewhat competitive, and this could be a temporary situation. Product design is far down the list. In fact, Canada was rated extremely poorly on its design ability - about the level of a semi-developed country.

Reasons for the deficiency in design often boil down to cultural historical and attitudinal differences. A variety of suggestions to improve the state of design in Canada were offered. These many suggestions include: better training of industrial designers, creation of awareness for the need for design (visibility, attitude changes), and more comprehensive and varied government support programs for design.

CONCLUSIONS

1. Industrial design has the potential for becoming a strategic variable in generating export (and domestic) sales for Canadian manufacturers.

The arguments of the economists, marketers, technological innovators and industrial designers all point to the same conclusion: product design is an important element of the marketing mix, particularly in the case of new products. For a country like Canada, lacking large home markets, economies of scale and cheap labor, product design makes sense as the key to international competitiveness. Product design, moreover, utilizes the one resource Canada has in abundance - a capable and well-educated labor force.

The evidence gathered from the field study supports these theoretical arguments. In the case of a handful of "better practice" firms, industrial design was the key to success in both foreign and domestic markets. Product design was given top rating as the critical element of the marketing mix (domestic and foreign sales), beating out salesforce, distribution and price. It was also accorded a high importance in the success of the firms' new product efforts. A number of separate case studies (Appendix A) revealed how other Canadian firms were able to profit from effective industrial design. Finally, the experiences of firms in other countries - and the export success derived from industrial design there - provided convincing evidence that industrial design can indeed "sell products"; and that industrial design provides the competitive edge for many firms in industrialized countries.

2. Industrial Design is currently recognized by some firms as a strategic variable.

The better practice firms in the study show that some firms, probably a minority, do recognize the strategic importance of industrial design to their domestic and international operations. These firms tended to accord the industrial design group a significant, often leading position in the organizational structure. Moreover, significant resources - both money and manpower - were devoted to the design function. Finally these firms were quick to note the key role that design played in their success.

3. But most Canadian firms probably do not share the same high regard for industrial design.

A look at Canadian industry at large reveals a gloomier picture for industrial design. The activity is not a highly visible one in Canadian business, and is generally relegated to a subordinate position in the organizational structure. Relatively little importance, top management involvement and time or effort are accorded to industrial design as a factor in new product development. Finally, design is not seen (at present) as a strategic factor in the creation of export sales for most Canadian firms.

4. Industrial design suffers from an identity crisis in Canadian business.

In spite of many valiant attempts (in Europe) to provide definitions of industrial design, it is doubtful whether the Canadian manager has any clearer notion of what industrial is than he had a decade ago. Perhaps the industrial designer is in part guilty; for the profession, in an apparent

attempt to enhance the field, has developed all-encompassing and grandiose definitions of industrial design. On the other hand, Canadian business has not responded to the challenge either. Industrial design in this country is dominated by an engineering and product function orientation. Where design does play a major role (as it did in these better practice firms), it tended to be equated with engineering and technology. Indeed, industrial designers were noticable for their absence from the design function.

5. Canadian firms in general lack strong market and international orientations in their design efforts.

Overall most Canadian manufacturing firms probably have not fully adopted the marketing concept. Even the better practice firms in our sample demonstrated a less than total commitment to customer satisfaction, customer needs and the use of marketing research. Although these same firms did adhere to an international point of view in their new product and design efforts, the same was not found true of Canadian industry generally. Most firms appear to develop products primarily for the Canadian market, with exports an afterthought. There appears little evidence of Canadian firms designing products first for world markets, adapting the design to suit local needs.

6. Canada is at a serious competitive disadvantage in world trade for manufactured items, particularly in the case of product design.

A comparison of Canada's marketing strengths versus those of our international competitors reveals Canada to be in a very weak position. In no area were we rated strong, while Canada's price competitiveness, a temporary situation, was the only area where we began to approach our competition. Industrial design was particularly deficient in Canada when

compared to the leaders, the U.S. and Germany. Canada's design effort ranked just above that of a developing country.

7. Canadian design does excell in a handful of product areas.

The only niches where Canadian design meets international standards include: telecommunications; office and industrial furniture; sports equipment and sportwear; fashion goods and clothing; electronics and medical equipment; and yachts and sailboats. A strategy of "building from one's position of strength" would focus Canadian design efforts on these product areas.

8. There is no easy answer about what ails industrial design in Canada. Rather, a complex and lengthy list of possible reasons explain our poor performance.

Canadian design suffers from many ailments. The two most important are a lack of history and tradition, and badly trained, inexperienced professionals. Canadian industry does not have the cutlural and craft tradition of European business; nor has there been the same consciousness of the appearance and form in the design of our manufactured goods. The European culture, history, and tradition leads to a more natural acceptance of industrial design by their business managers. Equally important, the Canadian industrial design professional may simply not be up to the standards of his European counterpart. The educational insitutions, design schools, the lack of an apprenticeship system, and the drain to the U.S., were blamed.

9. Equally clear is that there are no easy and direct solutions to what ails industrial design in Canada, although many suggestions were offered.

A number of suggestions for improvement were offered in the report. The most viable of these include:

- ① Communication: to increase awareness and acceptance of industrial design by business.
- ① Education: improved design schools, with an apprenticeship system.
improve industry's liason with universities.
- ① Industry: study (research) practices in other countries.
internalization of design (suggests training seminars, etc).
- ① Government: scheme for supporting entire new product process, from idea to launch.
support for redesign as well as design in new products.
hiring support for designers.
government consulting team.

Other comments are provided in Table 14.

* * * * *

The potential of industrial design as a export generation tool is readily apparent. Equally clear is that Canada is not in an enviable position when it comes to international design. But the question is not whether we should improve our design and compete for international markets. The simple fact is that our home market is someone else's international market. Rather, the issue is, how do we improve our design competitiveness while building on our distinctive competences and unique resources, yet recognizing our weaknesses and limitations. In short, what should Canada's industrial design strategy be?

A P P E N D I X A

Case Histories Of Successful
Canadian Designs

1. Can-Am Motorcycles by Bombardier

Industrial design proved the strategic variable in the success of Bombardier's new line of motocross high performance bikes. The design team looked at what the competition offered, analyzed the best, and then designed a bike that was highly competitive yet offered unique features. The result was a bike with an astounding record at race tracks and with equally impressive bottom line results. Sales were \$12 million in 1975, with more than half of production to export.

2. The Lazer Sailboat from Performance Sailcraft Inc.

Few design success stories can match that of Canada's Lazer sailboat. The designers hit on a winning formula: a low-cost high performance sailboat equally suited to pros and beginners. Industrial design in all its facets - appearance, performance, human engineering, production and shipping requirements - made the product the success it was, both domestically and abroad. A high performance hull that was easy to manufacture, a safe and comfortable cockpit, fittings designed for the beginner, and a convenience-to-rig capability were design elements contributing to the Lazer's market acceptance.

3. Constant Power Four Wheel Drive Tractor (Versatile Manufacturing Ltd.)

The year 1971 saw the introduction of Versatile's model 700 tractor. The tractor marked the beginning of a new era in Canadian agriculture and unprecedented growth for Versatile. The tractor gained an advantage over competing products through more power, and a number of convenience and fatigue reducing design features (easier controls, more comfort, improved visibility,

APPENDIX A Cont'd

safety, sound proofing and others). Design proved to be the key in both domestic and export markets.

4. Stem-Lite By Neeco Industries

Take the red light off a police car. Put high power flood lights under it. Put it on a collapsable pole and you've got Stem-Lite - a warning beacon for emergency cars and trucks which extends 12 feet above the vehicle, flashes a warning to traffic and lights up the surrounding area. As first developed, the unit was bulky, expensive, a hard-to-make and hard-to-fix product. Neeco turned the problem over to an industrial design firm. Their combined efforts resulted in a compact, less expensive, more reliable, easy to build Stem-Lite. Sales are excellent, 90% going outside of Canada.

APPENDIX A Cont'd

OTHER EXAMPLES OF CANADIAN DESIGN

U-Vic Thermofloat
(flotation jacket for cold water)

Mustang Sportswear Inc.

Traffic Operator Position System
(a community of telephone operator
work stations)

Northern Telecom

Potpourri Portable, Permanent &
Marine Toilet
(an 11 pound "go-anywhere" portable,
plastic toilet for land or marine use)

Sanitation Equipment Ltd.

SP 550 Swather
(self propelled hay and grain swather-
lighter weight, faster, more efficient)

Co-operative Implements Ltd.

Electric Yogurt Maker
(for consumer markets)

Rolmex Electro Inc.

Freeform Casework Furniture
(component system of furniture
for libraries, schools)

Cameron-McIndoo

Rapido X-Ray System
(automated X-Ray unit for
hospitals)

Picker X-Ray Manufacturing Ltd.

Electromic Coin Sorter
(sorts and totals coins)

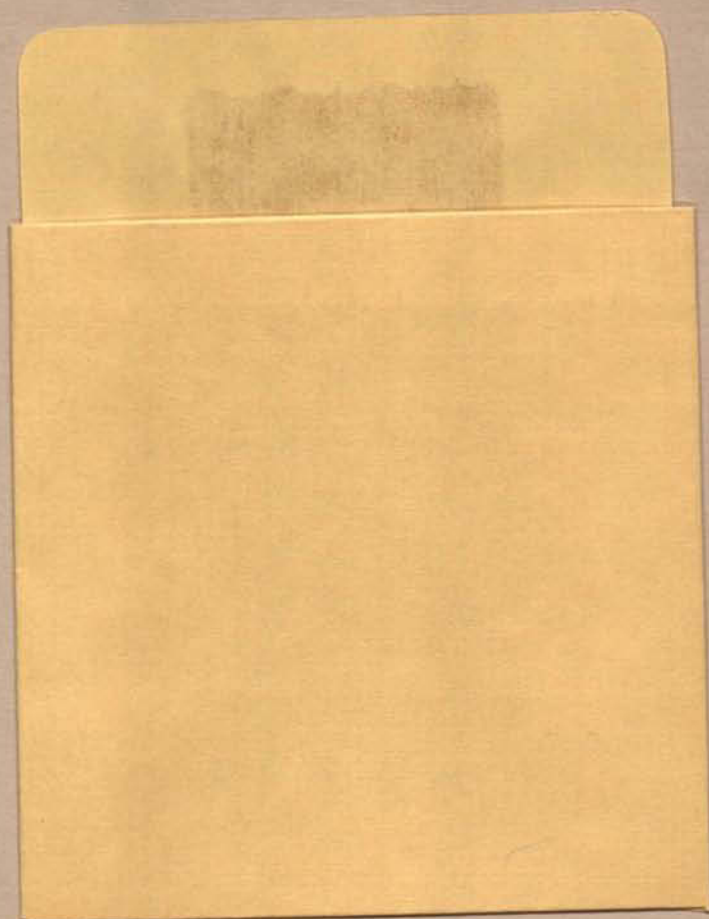
Wico Canada Inc.

RS Series Of Rock Pickers
(rock removal equipment for
agricultural land)

Shuttle Industries Ltd.

INEX Line Of Indoor-Outdoor Furniture
(Quebecois-look cedar furniture)

EPOK Inc.



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