Figure 11.2a. INDUSTRIAL PROBLEM SOLVING: The Importance of Design

EM9214: The Globe and Mail Editorial, November 13, 1992, page A22

Designed to appeal

CHRYSLER Corp. has unveiled a new line of automobiles – the so-called LH cars – under the names Chrysler Concorde, Dodge Intrepid and Eagle Vision. Their distinctive design is the main selling point and will determine how successful they are in the marketplace. This is particularly relevant to Canada because all the Chrysler LH cars are made at a Chrysler plant in Ontario. The quality of design in these cars has become a matter of local and national economic interest.

Fortunately, the LH cars are meeting with approbation by most critics and consumers. This example should raise our consciousness about the importance of design in the economy, not just in manufactured products, but in services and in the *process* by which goods and services are made. The concept of design includes the Total Quality movement – which focuses on process improvement – as well as the placement of wheels on the Dodge Intrepid and the curve of a handle on a kettle.

Consider computer software. Corel Systems Corp. of Ottawa is a significant global player in graphics software, largely because of the design of its product. It not only offers wide potential for artists and graphics people, it is relatively easy to use. It is also relatively inexpensive because of the efficient process design that lies behind it. Employment and income in this industry in Canada depends on the quality of design, from process to product.

Market success is associated with the design skills in certain industries in several countries. Italy is known for the design and manufacture of clothing and shoes, Sweden for furniture (and cars), Germany for machine tools and heavy equipment, Japan for consumer electronics. Among the biggest U.S. exports is television and film entertainment, riven with design values. Superior design explains both the competitive price and consumer appeal of the successful products and services.

Design is intellectual work. Reinventing a production process or conceiving of a new line of kitchen utensils is essentially intellectual. To flourish, then, design depends upon a social and business environment that values intellectual work in design, and supports it.

This is likely to be an urban environment in which public and semi-public institutions contribute to the sensibility and that honours design. From architecture faculties (including the Canadian Centre for Architecture in Montreal) to museums, galleries and schools of industrial design, art, interior design, graphics, television, engineering, and innovative places such as Toronto's new Design Exchange, which seeks to bring design and business together, particular institutions help sustain the environment for a design-sensitive economy.

This is the post-industrial economy. Design is centrestage, no cheap frill.

EM9002: The Globe and Mail, January 6, 1990, page D6

Those with designs on success may have to change their style

It was an arresting lead: "Sales of imported cars, especially Japanse cars, ran wild in October, while those of the North American car makers took a bruising tumble." Later in this news story, which appeared in *Report on Business* on Nov. 4, reporter Ken Romain wrote, "there appears to be no accounting for the sales splurge by the imports." Readers must have muttered, "Haven't you seen the new Japanese cars?"

In 1989, Canadian car sales by General Motors, Ford and Chrysler were down by 9 per cent from 1988. Sales of foreign cars were up by 1 per cent, with the major Japanese companies far ahead. Honda was up 13 per cent, Toyota 10 per cent and Suzuki 11 per cent. Nissan was down 6 per cent for the year, but up 3 per cent in December, probably reflecting the popularity of its brave new models. (Mazda and Subaru were down for the whole year.)

Why do Japanese cars fare so well in the market? Consumers are attracted by the quality of imports, but also by their conception – their *design* – even at premium prices. In discussing business, we too often confine ourselves to executives and managers. In large measure, the war between North America and Japan over cars is a war among designers. Design is the software that makes the hardware sell.

Almost 10 years ago, United Auto Workers president Douglas Fraser explained to a Detroit audience why he opposed import quotas on cars to protect his own union members. He argued that his workers' long-term security depended on U.S. auto companies getting the product right. He claimed that only falling profits and angry shareholders could win the attention of bovine Detroit automakers. So Mr. Fraser did not support import quotas.

What happened? General Motors' share of the U.S. car market fell from 57 per cent in 1978 to 35 per cent in 1987 – a staggering collapse of fortunes. Among the Big Three, Ford emerged with the best designs and quality, lowest product costs and highest profits on improved sales, but imports won the decade.

A study by the U.S. consulting firm Harbour and Associates Inc. says Ford employs an average of 3.36 workers per car per day, compared with Chrysler at 4.38 and General Motors at 4.99. This, among other things, leaves Ford with a profit of $591 (U.S.) per vehicle assembled in North America, compared with $228 for Chrysler and only $47 for GM. Good for Ford, but Japanese operations in North America required only 2.75 workers per car per day.

Under Chairman Roger Smith (the off-stage star of the witty current film *Roger and Me*), General Motors spent an average of $6-billion annually in the 1980s to automate its plants and design new cars. But GM's productivity is poor, and even its sportier new models still exhibit touches of plush and glitz that deter many consumers. The aura of another era lingers in the musculature and woodgrain veneer of too many GM cars.

The importance of design in manufacturing is still not understood in North America. We seek out Italian lamps, Japanese television sets, West German suits, Swedish bookcases and British stereos, in part because they are so esthetically pleasing. Throw in the probability that they are better made and more profitable than their North American equivalents and the predicament of our manufacturers is apparent.

This week in Toronto, haberdasher Harry Rosen mused about challenges facing retailers in the 1990s. He criticized the traditional

(*continued overleaf*)

system in which manufacturers create products they must sell to retailers who, in turn, must court and spark consumers. It is the retailers who have daily contact with the public, and the best information on their preferences. Citing the success of Ralph Loren's Polo line, Mr. Rosen says, "They're shrewd observers of contemporary life. When they want a product, they take it to the manufacturer," not the other way around. Harry Rosen does the same, and his business is expanding – not the other way around.

It is a cliché to say that we live in the information age, but what does that mean in practice? Well, design consists of nothing *but* information. The more information consumers have, the more importance they place on design. The less our manufacturers realize this, the more they are likely to end up sharing a "bruising tumble" with the Big Three. Designing women and designing men should be the hot business properties in the 1990s, insinuating knowledge into things that therefore succeed.

The two articles EM9214 and EM9002 reprinted overleaf on page 11.7 and above (in a total of 7 columns) draw attention to several important matters; a summary of these matters in point form is given below. [When available, relevant quotations from the articles are given *in italics* at the ends of some of the points.]

∗ Proper *design* of both goods and services is *essential* for survival in the 'post-industrial economy' (see also Point 2 on page 11.3 of Figure 11.1).
  - ○ Proper design is also vital for *processes* as well as for *products* (goods and services); this emphasis on processes includes design for *manufacturability* (of goods) or *deliverability* (of services) as well as for end use.
    - – *This example should raise our consciousness about the importance of design in .... the* process *by which goods and services are made.* [Column 1]
    - – *Employment and income .... depends on the quality of design, from process to product*. [Column 2]
    - – *Design is the software that makes the hardware sell.* [Column 4]
    - – *The importance of design in manufacturing is still not understood in North America*. [Column 5]
    - – *The more information consumers have, the more importance they place on design.* [Column 7]

∗ The main requirement is to improve *processes*; this reminds us of the 90/10 (or 95/5) rule and the potentially disastrous effects of regarding *workers* as the *main* cause of quality problems (see also Point 3 on page 11.3 of Figure 11.1).
  - – *The concept of design includes the Total Quality movement – which focusses on process improvement.* [Column 1]

∗ Design is a key ingredient in ensuring that goods and services of high quality remain *competitively priced.*
  - – *It is also relatively inexpensive because of the efficient process design that lies behind it.* [Column 2]
  - – *Superior design explains both the competitive price and consumer appeal of the successful products and services.* [Column 2]
  - – *He argued that his workers' long-term security depended on U. S. auto companies getting the product right.* [Column 4]
  - – *Throw in the probability that they are better made and more profitable than their North American equivalents and the predicament of our manufacturers is apparent.* [Column 5]

∗ Design is based on *knowledge* and *intellect* and it needs an appropriate environment if it is to flourish.
  - – *Design is intellectual work. Reinventing a production process or conceiving of a new line of kitchen utensils is essentially intellectual.* [Column 3]
  - – *To flourish, ... design depends upon a social and business environment that values intellectual work in design, and supports it.* [Column 3]
  - – *Well, design consists of nothing* but *information.* [Column 7]

∗ We recall that design is also essential in the *statistical* processes of data-based investigating – for instance, it is the second stage name in the FDEAC cycle.
  - ○ This point is first made in Figure 1.6 and the first illustration of some of the *consequences* of poor study design is given in Figure 1.7 of the STAT 220 Course Materials.

1 In the second paragraph of its right-hand column, the second article EM9002 reprinted overleaf on page 11.7 compares the average number of workers employed per car per day across the 'Big Three' North American automakers and Japanese automobile assembly operations in North America.
- ● What *conclusion(s)* does the author draw from these averages?
- ● Give reason(s) why these data might *not* provide a valid basis for these conclusion(s).

2 Comment critically, from a *statistical* perspective, on the last sentence of the article above: *Designing women and designing men should be the hot business properties in the 1990s, insinuating knowledge into things that therefore succeed.*