DECISION MAKING AND THE 
BREWING INDUSTRY

by

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF 
THE REQUIREMENTS FOR THE DEGREE OF 
MASTER OF BUSINESS ADMINISTRATION

in the Department of
Commerce and Business Administration

We accept this thesis as conforming 
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
MARCH, 1969
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Date 31st March, 1969
ABSTRACT

The nature of the brewing industry in British Columbia is determined by its marketing environment. All aspects of the environment have some influence but it is the legal variable which is the dominant factor. There is no other industry which is as strictly regulated as the brewing industry. This regulation severely restricts the use of the marketing decision variables, the usual means by which a firm can combat the environment, and thus the industry is in the peculiar position of being able to do relatively little in order to encourage sales.

The marketing environment is divided into five segments in this thesis and each segment is investigated in detail in order to determine its part in the overall picture. The constraints which the environment imposes on the decision variables are then examined and the means which are left for a firm to combat the environment are discussed.

The decision to use a particular method requires that several activities be undertaken first, in order to arrive at that decision. The sequence of activities which lead to a decision constitutes the process of decision making. Such a process is fundamental to every firm.

This thesis examines the theory behind the decision making process and a model is developed to describe the various steps. This model is then included in a general procedural
model for systematically dealing with several problems. To test theory against practice, this latter model is compared step-by-step with an actual problem that occurred in the brewing industry.
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ACKNOWLEDGMENT

I wish to take this opportunity to thank Molson's Capilano Brewery for their cooperation in allowing me to use their survey for this thesis and for allowing me to peruse their company files. Much of the data in this thesis comes from their records. In particular I would like to thank the marketing manager, Mr. O.F. Bales, who personally gave me much help and encouragement and spent a considerable time with me answering questions. Also I would like to express my appreciation to Mr. T.H. English, Vice President of Capilano, who generously made himself available in order to tell me about the history of the brewery and about the quota system. Without the help of these persons and the staff of Molson's, this thesis could not have been written.

My thesis advisor, Dr. F.A. Webster, also deserves special thanks for first suggesting that I combine summer employment with a thesis project and then for establishing contact with Molson's which later led to my employment. Finally I wish to thank my wife who has suffered much during my hours of study but who has always been ready with encouragement and help when needed.
CHAPTER I

INTRODUCTION

Origin of Thesis Topic

For three months during the summer of 1968 the writer was employed by the marketing department of Molson's Capilano Brewery in Vancouver. The work consisted of a variety of projects; the main one of which was to conduct a survey in order to gather information for a packaging problem with which Molson's was concerned at that time.

The packaging problem had arisen five months prior to the survey when Labatt Breweries introduced a new design for opening their beer cartons. Before this change, all the breweries were using the same design for their cartons. Because the breweries are limited in the use which they can make of their decision variables - due to legal restrictions and the homogeneity of their product - the new design naturally generated considerable interest. In order to evaluate the impact, if any, of the new carton top on beer drinkers, and in particular in order to determine whether Labatt's would be likely to increase their share of the market because of the new design, Molson's decided to conduct a survey. This project was given to the writer whose task was to design the questionnaire, conduct the interviews, and analyse the results. This thesis arose out of that survey and the subsequent knowledge about, and interest in, the brewing
industry and the decision-making process which developed during the writer's employment with Molson's Capilano Brewery.

**Purpose and Scope of the Thesis**

This thesis is entirely descriptive, except for one chapter, and has two purposes. One purpose is to describe the nature of the brewing industry in British Columbia, with particular emphasis on Molson's Capilano Brewery.

The brewing industry in British Columbia faces many unusual problems in the area of marketing due to the special characteristics of its marketing environment. The most notable characteristic is the legal factor. There is no more strictly regulated industry in British Columbia than the brewing industry. To overcome the problems created by the environment the brewing industry has to rely on its decision variables. However, many of these variables are constrained by the environment to the point where they become ineffectual. This interplay of environment and decision variables leads to further problems.

The other purpose of the thesis is to study the process of decision making - in theory and in practice - and to develop a prescriptive model of the process which can be incorporated into a general problem-solving model.

Some kind of decision-making process is fundamental to all firms. In some firms this process is carried out implicitly and little recognition is given to the individual steps which thus
tend to become indistinct. In other firms this process has reached a highly developed state and very sophisticated techniques are used to aid in problem solving.

**Methodology of the Studies**

In order to describe the nature of the brewing industry, we shall examine the marketing environment which faces the industry. We shall consider separately the main components of the environment which affect the industry and shall see how these components constrain the marketing decision variables and limit their effectiveness, thus creating additional problems for the industry.

The decision to use a decision variable can only be made after the prevailing situation has been analysed, data has been collected, and alternative decisions have been studied. We shall study the theoretical decision-making process which lies behind such a decision by reviewing some of the copious literature on the subject. We shall develop a model of this process and then incorporate it into a general model for solving problems. In order to test the theory of decision making, as developed in the model, with the actual practice of decision making, we shall compare the model step-by-step with Molson's approach to their packaging problem (mentioned previously).
Organisation of the Chapters

Specifically the contents of the chapters are as follows. Chapter II contains a brief history of beer, and then the history of Molson's is traced from its beginnings in 1786 to the present position of the Capilano Brewery in the brewing industry of British Columbia. This chapter is intended to provide background information about beer, the brewing industry, and Molson's, and to set the scene for the description of the marketing environment.

Chapter III outlines some of the problems which face the brewing industry in British Columbia by describing the marketing environment. The environment is broken down into five groups of factors: the economic, demographic, competitive, legal, and sociological variables. Each of these is discussed in turn to show their significance in the environment. The marketing decision variables, the controllable variables which the breweries may use to make use of, or to counteract, the environmental factors, are then examined and their limitations are discussed.

In Chapter IV the decision-making process, which lies behind the decisions to use the decision variables, is studied and a model of this process is developed. This model outlines the series of steps which are involved in making a decision, and describes in detail some of the techniques which may be used to evaluate alternative solutions and to select the best one. This
model is then incorporated into a broader, problem-solving model which attempts to provide a logical sequence of steps for dealing with a number of problems, such as the daily batch of problems which might confront a manager.

In Chapter V Molson's packaging problem is used as an example of decision-making in practice. The survey, which the writer conducted, is described in detail to illustrate one technique which may be used in the decision-making process to gather data. Decision making as practised by Molson's is then compared to decision making as developed in the model from Chapter IV.

The last Chapter, number VI, summarizes the thesis and draws conclusions.
CHAPTER II

A BRIEF HISTORY OF BREWING IN CANADA
AND OF MOLSON'S BREWERY LIMITED

Beer - the Ancient Beverage

It is not known for certain when man first began to make beer, but research workers have discovered indications that men were making this beverage 10,000 years ago. References to beer are found in the records of many ancient peoples, among them the Chinese, the Egyptians, the Greeks, the Romans, and the Gauls.1

The word 'beer' originally came from the Latin 'bibere' (to drink) and is first found in the 8th century in the old High German form 'peor' or 'bior'. However, the Germanic peoples had known about beer for at least eight centuries prior to that, and it was probably the Saxons from Germany who first introduced beer into Britain. The first recorded reference to this beverage in Britain was in 694 when a fine was imposed which was payable in Welsh ale.2

It was not until the Middle Ages that beer really became popular after the monasteries and feudal manors became active in brewing and in improving the beverage. Lager beer, a great improvement of those times, originated when the monks discovered that their brews could be stored by keeping them cool in cellars. By the 14th century brewing had become a well

*Throughout this thesis, footnotes will be found at the end of each chapter.
established industry and played a significant part in the commerce of the Northern European countries.

**Brewing in Canada in the Early Days**

As a result of this European heritage it is not surprising to find the early settlers in Canada, and particularly the religious houses, engaged in the ancient art of brewing - although at first this was not done on a commercial scale. Beer was still, at that time, mainly the drink of the middle classes, for, as the governor of Three Rivers reported in 1663, the wealthy drank wine, the less fortunate spruce beer, and practically all other families a drink called "bouillon" or "chousett" (a concoction made by dropping a ball of raw dough into spiced water and allowing it to ferment) while the poorest classes drank water.³

'Fire-water' or whisky was also popular in those days, particularly so among the Indians, and its consumption had reached such proportions by 1664 when the new intendent of New France, Jean Talon, arrived, that he founded a brewery in Quebec City in 1668 in order to promote temperance (the alcoholic content of beer being considerably less than that of whisky). It was the first commercial brewery in Canada and the beginning of the brewing industry. Today the brewing industry is Canada's oldest manufacturing industry, and 1968 marked the 300th anniversary of its foundation.
Although Talon's brewery was a failure and closed down in 1674, this initial venture sparked the interest of other parties and several attempts followed, most of them doomed to end in failure, however. It seems that at that time, those people who wanted beer were prepared to make it themselves. After 1725 there are no records of any new breweries for the next sixty years, and a visitor to Canada in 1749 stated that barley beer was yet to be introduced although spruce beer was brewed in the summer.

With the battle of the Abraham Heights in 1759 and the consequent British occupation there came a profound change. Trade with the West Indies brought in vast quantities of cheap rum. By 1766, two hundred and three licences had been issued to permit the sale of alcoholic drinks and rum had taken over from whisky as the Indian curse.4

The Foundation of Molson's Brewery

By the 1780's the population of Montreal had increased considerably through the influx of British and United Empire Loyalists, and thus the antipathy between Canada and beer changed to one of yearning for English ale. It was to this climate of change that John Molson came in 1782 from Lincolnshire, England.5 He was eighteen years old and the son of a farmer. Although he had no brewery experience he entered, immediately after his arrival, into a partnership with Thomas Loid, the owner of a
rather primitive brewery in Montreal. In 1785 John Molson became sole owner of the brewery and in 1786 he started making beer. Since then the Molson family, through six generations, have brewed beer continuously at the same location. Thus not only is Molson’s Brewery one of the oldest manufacturing enterprises in North America, but quite possibly it is the oldest one conducted at its original location by descendants of the founder.

The first years were tough years for John Molson and his brewery, and although he made a small profit after the first season, it was nearly ten years before his earnings compensated him for his hard labours. He not only had to act as buyer, maltster, brewmaster, clerk, and salesman, but also as book-keeper. Having had no training in the art of book-keeping, the books went unbalanced for twenty years until 1816 when he took his three sons into partnership. However, this was of little consequence because he had no one to account to, no returns to make, and no excise or income taxes to pay; but it does mean that records are not very complete for these early years. Despite the initial hardships the business survived, which was quite an achievement, because few industries have been more at the mercy of unpredictable changes in public taste and fancy, and few have experienced a higher rate of individual mortality, than the brewing industry. This success was largely due to the technical and business abilities of John Molson, and later, to those of his descendants.
As with Talon's entrance into brewing, so Molson's entry generated renewed interest, and towards the end of the 18th century and at the beginning of the 19th century several breweries started in Quebec, but this time many of them were successful.

In 1799 Molson purchased a still and in the following year he commenced to make whisky, but only sporadically, until 1821 at which time the demand was so great that he started in earnest. For more than forty years until 1866 Molson's were Canada's largest distillers. In 1866 the firm found that it could no longer make a profit without adopting the corrupt practices then prevalent in the trade, and so it discontinued making whisky.

In 1911 the company ceased to be a partnership and became a limited private company under the name of Molson's Brewery Limited. This was to give the Molson family more protection in the case of the death of either of the two Molson partners. In 1945 the company went public with the issuance of 750,000 shares. The name of the company remained the same.

Since that time expansion into the rest of Canada has been rapid. In 1955 rising sales in Ontario prompted the building of a new brewery in Toronto. In 1959 Molson's took over Sick's Breweries which thus provided Molson's with five breweries in Saskatchewan, Alberta, and British Columbia. To
gain a share of the Manitoba market, Molson's acquired the Fort Garry Brewery in Winnipeg in 1960, and two years later expansion occurred to the East of Quebec when Molson's purchased the Newfoundland Brewery.

Molson's and the Capilano Brewery

One of the breweries acquired by Molson's when they bought Sick's Breweries was the Sick's Capilano Brewery in Vancouver. It subsequently became Molson's Capilano Brewery on September 30th, 1959, and it is with this particular brewery that this paper is mainly concerned.

When Molson's took over the Capilano brewery it was marketing two brands of beer, Old Style (a lager), and Sick's Select (an ale). Old Style was an old and familiar brand having been introduced to the market by Sick's in 1934. In 1959 it accounted for approximately 98% of the brewery's bottled sales. Sick's Select was a more recent product having been introduced in November of 1957. Capilano's share of the industry market (P.B.W.) was approximately 20% (19% of the bottled market) when Molson's took over.

The Quota System

Capilano's share of the bottled market at 19% was in fact down from the previous years when their share, under the quota system, had been 20%. The quota system, which was in operation during the early 1950's, was a system for allocating the industry
sales in the province each month between breweries. All the Western provinces from Manitoba to British Columbia operated under a quota system at that time. The system was administered by the provincial governments in all four provinces except British Columbia. In British Columbia the Pacific Brewers Association (the forerunner of the P.B.W.) administered the quotas for the three companies which owned the P.B.A. - Vancouver Breweries, Lucky Lager Breweries, and Sick's Capilano Brewery. At that time P.B.A. accounted for about 88% of the total industry sales in British Columbia. The quota system was a voluntary scheme in British Columbia that had been in operation since the 1930's. It was sanctioned by all governments up to the time of the Social Credit government. The Social Credit government, however, even though they knew that the quota system existed, would not sanction it officially or unofficially, but even so the system worked well for nearly six years of Social Credit government.

Without official recognition, however, it was fairly easy for any one company to set about breaking the quota arrangement and this is just what Vancouver Breweries started to do in 1956. At that time the quotas were Capilano 20%, Lucky Lager 40%, and Vancouver 40%. Also, by mutual agreement, each of the three companies maintained only one salesman.
In 1956 Vancouver Breweries started to increase their staff of salesmen and attempted to disrupt the quota system by informing various hotel keepers and liquor vendors that the quota system was doomed and persuading them, with minor pay-offs and similar methods, that their cooperation with the P.B.A. was not necessary. Vancouver Breweries were in fact preparing the market for their change of name (to Carling's) and the introduction of Carling's products. Their main efforts were directed at the bottled market. As Vancouver Breweries became more aggressive in the bottled market, Lucky Lager counteracted by concentrating on draught accounts. This was possible because in the early days various personal transactions with hotel operators had created a moral obligation on the part of the operators which they were now given the opportunity to honour. At the same time Lucky Lager also commenced, as did Capilano, to add to their sales staff and to increase their advertising budgets. However, by the time they started, Carling's had opened up quite a lead.

In May 1957 Carling's introduced their two national brands to the market (Black Label and Red Cap), and by midsummer both Capilano and Lucky Lager had lost a considerable share of the market. At that time Capilano only had only one brand on the market - Old Style. In November of that year they introduced a second brand, Sick's Select, and gained a small share of the market back. However, lack of a proper advertising campaign, due to a limited advertising budget, did not help its introduction
and it soon levelled off at slightly less than 2% of the (P.B.A.) bottled market.

By early 1958 Capilano was showing signs of strengthening but it faced a set back in the spring of that year when Labatt's took over the Lucky Lager Brewery. In August Labatt's introduced Labatt's Pilsner and 50 Ale and this finally caused the end of the quota system. Carling's, by their tactics of upsetting the market and making the balancing of quotas impossible, were obviously looking for a reason to break the system. Their Pilsner brand had been on the market for many years and was their largest selling brand. When Labatt's announced the introduction of their Pilsner, Carling's found their reason for breaking the system and reported to the P.B.A. that after July of that year they would no longer be a party to the quota system.

It is interesting to note that at the time that the system was abandoned, Carling's had 46% of the market. Their share today is 30%. However, whether or not the system would have continued today, even if Carling's had not broken it then, is a debatable question.

In October 1958 O'Keefe's introduced Old Vienna and O'Keefe's Ale onto the market. However, they were brewed in the Carling brewery until February 1961 when O'Keefe's commenced brewing in their own plant. They became a member of P.B.W. in 1960.
This was the climate of the market into which Molson's stepped in 1959. The competition was intense and no strategy, ethical, or in some cases unethical, was left untried.

The Growth of the Capilano Brewery

On September 1st, 1959, the Capilano plant started brewing Molson's national brand, Export Ale. Previously, since 1957, it had been sent from Montreal and sold at a premium price of 20¢ per dozen as was usual for ales at that time. It had not been advertized locally except in the national magazines originating from the East. In 1958 it held 67% of the light ale market. After commencement of brewing at Capilano it was expected initially to gain 11% of the light ale market, but in fact it had risen to 34% by 1960. Since then it has declined slightly and has levelled off at about 31.2% of the light ale market or about 1% of the industry packaged sales.

In February 1960 Molson's other national brand, Molson's Canadian, was introduced to the British Columbia market and Sick's Select was withdrawn. Despite a massive initial advertising campaign Canadian has proved disappointing and has never really gained a footing. It initially captured 3.8% of the lager market and by February of 1961 it had risen to 5.0%. Since then it has declined steadily to its present level of 2.65% of the lager market or 2.6% of the industry packaged sales.

Old Style held about 20% of the lager market in 1959 and accounted for approximately 98% of Sick's Capilano sales.
This latter percentage has declined slightly so that today Old Style accounts for about 89% of the brewery's sales (Canadian accounts for about 8% and Export Ale for about 3%) and holds 32% of the lager market.

Since 1959 Molson's have spent an average of $353,200 per year on capital expenditures to April 1968. Although the brewkettle has remained the same size (at 208 barrels), the bottling line (which is also used for cans) has been increased from 156 bottles per minute to 550 bottles per minute, and the capacity of the plant (through increased line rate and more efficient production techniques) is now 350,000 barrels per year (160,000 barrels per year in 1959). The number of hourly workers has increased from 78 in 1959 to 99, and the number of staff workers from 17 to 38. Molson's share of the market (P.B.W.) - packaged and draught - has increased from approximately 20% in 1959 to 29% today (the packaged share has increased from 19% to 34%). In actual volume this represents an increase from 3,380,085 gallons, in the twelve months prior to September 1959, to 7,956,459 gallons, in the twelve months prior to July 1968. This is an increase of 135% or an average of 15% per year. The industry (P.B.W.) volume during this time increased from 17, 241,881 gallons in 1959 to 26,955,825 gallons in 1968, or at about 6.2% per year. With this increase in volume, profits have also increased for the brewery from $251,549 (for the nine months January to September, 1959) to $1,174,946 in fiscal 1968.
The brewery industry in British Columbia is showing slow but steady growth with a rate of about 2.9% per year increase in adult per capita consumption. With the adult population of British Columbia growing at about 2.6% per year and disposable income at 3.7% per year per adult, the future for the brewing industry in British Columbia looks assured of steady growth. With this in mind the Capilano brewery plans substantial expansion during the next five years. The cellars, which have doubled in size since 1959, were again increased last year (1968). This year work is expected to start on a new brewhouse and the brewkettle will be enlarged by three times its present size to 624 barrels. This will give an estimated yearly capacity of 300,000 barrels by 1973, and when the bottling line is also increased this could mean an annual capacity of about 560,000 barrels. Other projects in the present five-year plan include a new bottleshop, additional warehousing, new offices, and finally more cellar space. The last phase of the program will start in 1974. When these alterations are finally completed the present brewery will hardly be recognizable. But that will not be the end of expansion. In order to keep ahead of the steadily increasing market, Molson's plan a continuous five-year program which is reviewed each year and is revised when necessary. Thus expansion is a continuous process in the brewery.
FOOTNOTES


5. This history of Molson's Brewery is taken from Denison, *op.cit.*

6. P.B.W., or Pacific Brewers Warehousing, is the distribution organisation for the four breweries of Carling's, Labatt's, Molson's and O'Keefe's. When the term "industry sales" is used in this thesis, the sales referred to are those of P.B.W. When the term "total industry sales" is used, the sales refer to the total sales for the province.

7. The history of the quota system comes from an unpublished memo by T.H. English, Vice President of Molson's Capilano Brewery.
CHAPTER III

THE MARKETING ENVIRONMENT FACING THE BREWING INDUSTRY

AND THE CONSEQUENT PROBLEMS FOR ITS

MARKETING DECISION VARIABLES

Introduction

There are many factors which affect a company's sales. Some of these factors can be controlled by the firm but some are beyond the firm's control. Those factors which the firm can control are called the marketing decision variables. Those which are outside the firm's control are called the environmental variables.

It is the marketing environment which defines the opportunities and constraints which face the firm, and in order to survive, the firm must continually survey the environment and adapt its decision variables according to the trends.

In this chapter we shall outline the main characteristics of the marketing environment which the brewing industry must consider, and shall briefly describe any significant trends which these characteristics display. We shall then examine the decision variables and discuss their limitations due to environmental constraints.

The Marketing Environment

There are several ways to classify the external variables of the environment. In this paper we will divide them into the following five categories which contain the
factors with which the brewing industry is mainly concerned: the economic, demographic, competitive, legal, and sociological variables.¹

The Economic Factors

Since people in lower-income categories are usually more directly affected by economic slow-downs than those in higher brackets, and because the majority of beer drinkers are in these categories, it is logical that the beer market suffers during such times of recession. This can be demonstrated by plotting the consumption of wine, beer, and spirits against employment levels.² Such a graph shows that beer consumption reacts more severely to fluctuations in employment than do the other alcoholic beverages.

Since 1961 the Canadian economy has paralleled the American economy and has shown general expansion, with rapid gains in employment, growth in personal income, a continuous rise in living standards, reductions in unemployment, and growth in capital investment. The strongest and most diversified gains have been made in the two highest income regions, British Columbia and Ontario.³

In 1967 British Columbia had an unemployment rate of 5.1% compared to the national average of 4.7%.⁴ The highest rate in British Columbia since the war was 9.4% in 1958 and there has been a general downward trend since then although the
rates for the last two years (1966 and 1967) have shown a tendency to increase slightly. In 1967 only two other areas in Canada, the province of Quebec and the Atlantic provinces, had higher rates (with 5.3% and 6.6% respectively). However, employment in 1967 increased 6.6% which compares favorably with the national rate of 3.2%. Since the War employment in British Columbia has increased 85.4% (1946-67) which is the highest percentage gain among the provinces.

The Demographic Factors

The consumption of beer is affected by many factors, such as the type of retail outlets provided, the consumer marketing convenience, the distribution of the population, the growth of the adult population, income growth, the price of beer in relation to other alcoholic beverages, the local legislation relative to beer marketing, the weather conditions, and so on. The three most important factors, from regression analysis, are 1) the growth rate of the adult population, 2) the beer/spirits price relationship, and 3) the per capita disposable income. The first and third factors are demographic variables.

The population of British Columbia increased by 15.0% between 1961 and 1966 and this was the largest percentage increase among the provinces. This increase was mainly due to net migration which was 140,489. As a percentage of the provincial total, this is the largest among the provinces. In actual numbers Ontario had the greatest migration but because
of Ontario's larger population, this figure was only about one-third of the percentage figure for British Columbia. Since the war the annual net migration figure for British Columbia has been increasing from about 20,000 per year in the 1940's to about 28,000 per year in the 1960's.

The adult population of British Columbia (over 20 years of age because of the census categories) was approximately 61% of the total population in 1966. This percentage has declined slightly since 1951 when it was 68% of the total population. However, the actual number has shown an average yearly growth rate since 1951 of 2.9% (the average growth rate for the total population was 4.0% per year). This compares well with the average national figure for the same period of 2.2% (2.9% for the total population).

The personal disposable income per capita in British Columbia in 1967 was $2261. This was the second highest figure in Canada and is well above the national average of $2044. Since the war the personal disposable income per capita in British Columbia has grown 172% and British Columbia has consistently vied with Ontario for the highest level. Although this is good for the people, it is not necessarily good for the brewing industry. More people in the high-income groups consume wine and spirits than do those in the lower categories, possibly to the detriment of beer. The prosperity of the people in British Columbia is reflected in the fact that British Columbia
has had the highest per capita consumption of spirits in the provinces since 1952. The consumption of wine has also been growing rapidly since 1952, the per capita consumption having increased 235.5% up to 1965, compared to 10.6% for beer, so that British Columbia now has the highest per capita consumption of wine in Canada. The per capita consumption of beer in British Columbia, however, falls behind that of Ontario, Quebec, and Manitoba. The result of these trends is that, while personal disposable income per person has increased by more than 50% since 1952 (to 1965), the share of personal expenditures spent on beer has declined in relation to the total spent on alcoholic beverages. These changes for British Columbia are shown below and in Figure 1 (see also Appendix A).

<table>
<thead>
<tr>
<th>TOTAL PER CAPITA</th>
<th>1952-1965</th>
<th>Beer</th>
<th>Spirits</th>
<th>Wine</th>
<th>PDI</th>
<th>Beer</th>
<th>Spirits</th>
<th>Wine</th>
<th>PDI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage change</td>
<td>64.9</td>
<td>72.2</td>
<td>394.9</td>
<td>134.9</td>
<td>106</td>
<td>156</td>
<td>2355</td>
<td>526</td>
<td></td>
</tr>
<tr>
<td>Percentage change per year</td>
<td>4.9</td>
<td>5.5</td>
<td>30.4</td>
<td>10.4</td>
<td>0.8</td>
<td>12</td>
<td>181</td>
<td>44</td>
<td></td>
</tr>
</tbody>
</table>

The Competitive Factors

In British Columbia there are four major brewing companies: Carling Breweries Ltd., Labatt Breweries Ltd., Molson's Capilano Brewery, Ltd., and O'Keefe Old Vienna Brewing, Ltd., which are all situated in Vancouver. These four breweries account for approximately 95% of the total sales for the industry (by volume) in British Columbia. The remaining
FIGURE 1. Change in Per Capita Consumption of Beer, Spirits, and Wine, and in Personal Disposable Income Per Person, in British Columbia.

Source: based on a diagram in Brewing in Canada (with supplement) (Ottawa: Brewers Association of Canada, 1965), p. 22.
5% comes from two small breweries, Tartan Brewery Ltd., located in Prince George, and Interior Breweries Ltd., located in Creston. Thus there exists the classic oligopolistic situation of few sellers with a 'differentiated' product. However, the situation is rather different from the usual case because of the many legal regulations (which will be discussed in the next section). The strategies available to the breweries are definitely lessened by these regulations, but this is not necessarily a bad thing. By controlling the price of beer, the government ensures that there will be no price wars. Because advertising is regulated, all the breweries are limited in how much they can spend and this helps to keep costs down. The regulations on distribution tend to limit the sales of the industry as a whole and therefore should possibly be eased, although none of the breweries suffer individually and costs are again kept down.

However, competition within the industry is not so serious as that from other industries, namely the wine, spirits, and soft drinks industries. These industries have been making steady gains since the war, particularly the wine industry (see figure 1). These gains have meant that beer, as a percentage of total alcoholic sales (in dollars) has declined from 40% in 1952 to 37% in 1965. Although these figures apply to British Columbia, this trend is evident right across Canada and must be of some concern to the brewing industry.
The Legal Factors

There are no other industries in British Columbia which are so strictly regulated (they have their own special act, the Liquor Control Act) and are so discriminated against, as the wine, spirits, and brewing industries. The type and amount of advertising is severely restricted; distribution is limited to certain places and certain hours; and prices are set by the government. Thus the industry has only one decision variable over which it has any real degree of control, its product. The laws concerning price, promotion, and distribution, will be examined further when we deal with the industry's decision variables.

In the previous paragraph we described the alcoholic industries as being discriminated against. This discrimination occurs in the manner in which these industries are taxed.

Taxes are the strongest influence on the brewing industry; they are the largest cost component and affect profits more than any other factor. Taxes are levied on the breweries by all levels of government. The federal government levies an excise duty of 38% on each gallon of beer produced and on top of this applies the federal sales tax of 12%. Each brewery also has to pay a corporation tax to the federal government. At the provincial level, there is the mark-up applied by the Liquor Control Board of a little over 19% (of selling price to the consumer), the provincial sales tax of 5%, and the cost of a provincial brewer's license (which equals 1% of
the value of the land and improvements on which the brewery stands). At the municipal level there are property and business taxes to be paid. All of these add up to a huge burden on the brewer. For every consumer dollar spent on beer in 1967, 33% went to the government, 34% to the brewer, and 33% to the licensee.\textsuperscript{11} There is evidence that the growth of the brewing industry since the war, relative to other manufacturing industries, has been impeded by the weight of taxes (and by the other forms of government control).

One other factor has to be considered with regard to taxes. There are few industries whose products are consumed within the local provincial boundaries to the same extent as the product of the brewing industry. Thus the brewing industry provides a disproportionate share of the province's sales tax revenue and this would seem good justification for lightening the burden.

The Sociological Factors

It seems that drinking alcoholic beverages in British Columbia is positively discouraged by the provincial government. Not only does the government make it difficult to market alcoholic drinks, but it does its best to dissuade the public from buying it. The majority of liquor stores, at least in Vancouver, are exceedingly drab, the service is often surly, and for a year during 1967 through 1968 the stores had no printed lists of the available merchandise. This narrow attitude of the government
seems to have affected the public with the result that the beer parlors do not have the social atmosphere of the English "pubs" but are strictly places where people go to drink. There is evidence of changing attitudes, but the change is very slow, because there are many people who agree with the government's attitude towards drink. For this reason the breweries have to tread carefully when pressing for changes in the legislation and when designing their advertising programs.

Summary of the Marketing Environment

The marketing environment facing the brewing industry can be summed up as follows. British Columbia continues to attract large numbers of people. Employment is growing faster than the national rate, and the per capita personal disposable income is the second highest in Canada. However, the unemployment rate is higher than the national figure. Thus, generally, the economic climate is good for the brewing industry. Competition within the industry is intense, but competition with other beverage industries is even stronger and the other beverage industries seem to be gaining (a trend which is visible throughout Canada). As an industry, the breweries are over regulated by the government and this is restricting expansion. The sociological climate is changing slowly, but due largely to the puritanical attitude of the government, drinking tends to be a serious rather than social affair.
The Decision Variables

Given the marketing environment, how can the firm help to stimulate its sales? It can do so by the use of its marketing decision variables. These variables have been classified in different ways by different authors. In this paper we shall follow the classification proposed by E. Jerome McCarthy and divide the variables into the 'Four Ps': product, promotion, price, and place. We will examine each of these in turn.

The Product

In the brewing industry the product is of course beer. In British Columbia there are two main types of beer - lager and ale. Lager accounts for approximately 98% of the total volume of sales and ale accounts for approximately 2%. Porter and stout make up less than 2%.

There are thirty-one brands of beer for sale in British Columbia of which ten are national brands sold right across Canada. Amongst Molson's three brands, Old Style and Molson's Canadian are lagers, and Export Ale is, naturally, an ale. The Canadian and Export brands are national brands.

As mentioned previously, the product is the decision variable over which the firm has the most control. However, because of the nature of the product, it turns out that this decision variable is rather ineffectual. Of the two main product strategies, differentiation through product modification and differentiation through new product development, the first
can not be really applied and the second has so far proved to be largely unsuccessful. Beer is not regarded as having different qualities and it has no visible features, thus product modification through quality and feature improvement is not feasible. The third frequently used modification, strategy, styling improvement, is also not very applicable. The brewing industry has agreed to use standard sized bottles for ease of handling and thus this aspect of packaging can not be altered. The labels on the bottles can be used for advertising, although the law regulates what can be said, but it is doubtful whether many people read the labels. The cartons can be used for advertising, subject to certain regulations, and the method of opening the cartons can be modified but the brewing industry has agreed to keep the size of the cartons standard, again in order to facilitate storing, shipping and repacking them. The effect of modifying the method of opening will be dealt with further in Chapter V when we discuss the results of the survey.

With the strategy of differentiation through product modification being so limited in scope, the breweries have tried differentiation through new product development, but generally with little success. During the past five years there have been three new brands introduced into British Columbia- Stein, Charrington Toby, and Gold Keg. Their present collective share of the market is less than 2%. The reason for their failure is not certain but it is probably due to the fact that
the majority of beer drinkers have a definite favorite brand (see the results of the survey in Chapter V) and it is very difficult to replace this favorite. There are probably several reasons why this is so. The difficulty of producing a beer with a sufficiently different taste to the others could be one reason. The restrictions placed on advertising, mentioned in a later section, could be another.

Another way that the breweries have tried to stimulate sales is by selling their brands nationally. This is based on the theory that because more and more people are moving about the country they represent an expanding segment of the market. If these people are able to obtain their favorite beer in each province, then they will remain loyal to their favorite brand and thus sales will at least remain constant and hopefully will expand. However, so far this strategy has not been very successful. Different regions have individual tastes and brands are more successful if brewed locally according to the prevailing taste. The introduction of new brands into a region, as mentioned above, is very difficult. Molson's have examples of this. Their two national brands account for only 5% of their sales in British Columbia.

Promotion

All advertising by the brewing industry, as well as sales methods, are governed by the provincial authorities. In addition to this control by the province, the Board of Broad-
cast Governors, a federal body, also has a say on the nature of radio and television broadcasting. Preparation of advertising programs thus requires an expert in law as well as in copy preparation! The provincial regulations of course vary from province to province but appear to be more severe in the West than in the East of Canada. In British Columbia they can only be described as an anachronism. For instance, the size and number of advertisements in newspapers is limited, and the color must be black and white; the advertisements can not show family groups or children or outdoor scenes; no phrases inferring price may be used, and so on. Radio and television cannot be used for advertising, and neither can billboards. Magazines may be used and the advertisements are not restricted in size or colour - as long as these advertisements originate in the East of Canada. In the area of sales methods the breweries again are strictly regulated. Salesmen are not allowed to solicit sales or to take orders for purchases. They can not give away free samples and they can not make price concessions.

Such restrictions only offer frustration to the breweries and they have to learn to cope as best they can. Molson's makes extensive use of the newspapers and, through imaginative advertising, they find that they get good recall. Extensive use is also made by Molson's, and the rest of the brewing industry, of Channel 12 on Bellingham television. However, again there are restrictions in that the breweries are
only allowed to advertise between 8 p.m. and 12 p.m. (unless they are sponsoring a live event). Because of the temperate views of a certain segment of the population, the breweries take care to ensure that their advertising campaigns are in no way objectionable to this segment.

The four major breweries and Tartan Brewery are not allowed to send salesmen into the Kootenays area of British Columbia and are not allowed to advertise there in the local newspapers. The price of their beer is also sold at a premium (but the Liquor Control Board pays the transportation costs from Vancouver and Prince George). This is due to historical fact. Originally there were three small breweries in the Kootenays. These were in danger of closing and so they amalgamated to form Interior Breweries Ltd. and the provincial government gave them protection from the other breweries as outlined above. In fact, the four major breweries never did do much business there and so they do not object to the situation.

Because of the restrictions on advertising the brewing industry is forced to use other means of promotion, and all of the major breweries are heavily involved in sponsoring public projects, particularly sports clubs (such as hockey, football, baseball, lacrosse, darts, bowling clubs, and so on). Molson's sponsors over 200 local sporting activities but this sponsorship is not widely known. Its best known connection with sport is with the Montreal Canadiens. Since 1965 Molson's have extended their connection with sport by offering ten hockey
scholarships annually in the amount of $500, tenable at any university in British Columbia which has a hockey team. Molson's also contributes to other causes, such as the Kinsmen's conventions and various ethnic associations. The brewing industry as a whole are generous contributors to health and welfare, education, and cultural and religious causes. Figures collected by the National Industrial Conference Board indicate that donations by the brewing industry amount to a rate of 1.87% of profits before taxes compared to the average Canadian industry figure of 1.1%. Most of these contributions have, as their ultimate aim, the stimulation of sales.

Price

The consumption of beer is greater in relation to other alcoholic beverages among the middle and lower income groups and it is these groups which are most sensitive to local economic conditions, particularly to prices. Because of their sensitivity to prices, the breweries try to keep the price of beer within the range of the average consumer. Actually the price is set by the Liquor Control Board and the breweries have to make representation to get price changes. The government is mainly concerned with its revenues and is not particularly interested in whether or not the price is within the range of the average consumer. This has meant that the breweries, in order to keep the price down, have had to absorb the increases in taxes themselves. In May 1951 there was an increase
in all prices (from the manufacturer's to the consumer's) due to the increase in federal sales tax from 8% to 10%. In March 1954 the provincial sales tax was increased from 3% to 5% and the method of levying the excise duty was changed from 21¢ per pound of malt used to 38¢ per gallon of beer produced. The change in sales tax caused the price of beer to the consumer to be raised but the breweries did not increase their factory selling price (even though the new excise duty was more expensive). In 1959 the federal sales tax was increased from 10% to 11% and again in 1966 it was increased from 11% to 12%. In both cases the increases were absorbed by the breweries. In July 1967, because of increased costs since 1951, the breweries requested a 2¢ per dozen increase which the government granted while at the same time increasing the cost to the consumer by 5¢. In December of the same year the excise duty was increased to 42¢ per gallon and this 4¢ increase was added to the breweries' selling price per dozen while the government raised their price to the consumer by 6¢. Thus, of the 11¢ increase in price to the consumer between 1954 and 1968 the federal government gained 59.6%, the provincial government gained 45.4%, and the breweries suffered a 5.0% decrease in revenue (see Figure 2).

In their attempt to keep the price down, between 1951 and 1967, the breweries had to absorb not only the increases in taxes but also the continually increasing costs
Figure 2. Illustration of how the Price Increase of 11¢ Per Dozen Bottles is divided - 1968 compared with 1958.

| Source: from confidential data compiled by the Brewers Association of Canada. |

<table>
<thead>
<tr>
<th>Brewers</th>
<th>Decrease 5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>Increase 59.6%</td>
</tr>
<tr>
<td>Provincial</td>
<td>Increase 45.4%</td>
</tr>
</tbody>
</table>

of materials and labour. Since the war productivity has improved considerably through the introduction of better production techniques and the broad application of mechanized handling throughout the brewery, and this helped to offset
increasing costs. However, during the last few years technological improvement has levelled off and new cost reducing ways will have to be found if the price is to be kept down while maintaining the profit level at the same time.

Ideally the breweries would like to reduce their abnormally heavy taxation burden. However, it is very hard to get taxes reduced and the provincial government, whose share of the consumer dollar has increased more than 8% since 1951, is not at all receptive to the idea. Consequently, in order to keep the price of beer at a reasonable level, the breweries are forced to absorb increases in taxes.

Distribution

The fourth of the 'Four Ps' - place, or rather, distribution - is also, as we have mentioned previously, regulated by the government. In British Columbia the only places that may sell beer are the provincially owned liquor stores, and licensees (such as hotels, certain clubs, and armed forces messes). There is also home delivery from certain liquor stores. This restriction on distribution impedes the marketing of beer. It has been shown that the type of retail outlet and the accessibility of the outlet affect the consumption of beer, and the breweries can do nothing, or very little, about these two factors.

In British Columbia the liquor stores account for 70% of beer sales in the province. This is, in part, due to
the wide choice of brands that they offer. However, it is also
due to the wide differential between the liquor store prices
and the licensee prices (at present $1.02 per dozen in favor
of the liquor stores). The greater this differential, the
less likely is the consumer to buy from the licensee. On the
other hand, experience in Manitoba, where the prices are the
same in the liquor board outlets and the licensee outlets,
shows that people prefer to buy at licensee outlets. The
British Columbia government, by maintaining its price advantage,
thus unfairly encourages people to buy from its stores and
virtually takes choice away from the consumer. It thus in
effect restricts the breweries' choices of outlets.

Summary

Generally the marketing problems facing the brewing
industry in British Columbia are irksome, frustrating, and
antiquated. The rigid price controls together with the abnorm-
ally heavy tax load, the excessively restrictive advertising
laws, and the limited distributing channels, all add up to a
definite discouragement to the brewing industry by the govern-
ment. The brewing industry can only hope to change the present
situation by educating the government through the publication
of unbiased facts and statistics. The Brewers Association of
Canada is doing a good job in this respect but one feels that
the breweries themselves, through their local brewers' organi-
sation, are not presenting these facts to the provincial
government as forcefully as is necessary in order to obtain a revision of the laws in the not too distant future.

FOOTNOTES


4. All data in this section is from the Canada Year Book, 1968.

5. Kappele, Wright, and Macleod, op. cit.

6. Data from the Canada Year Book, 1968.


8. Data from Brewing in Canada (with supplement) (Ottawa: Brewers Association of Canada, 1965), appendix III and Table IV.

9. Comparable data are not available for the soft drink industry, but Kappele, Wright, and Macleod, op. cit., estimate the total consumption growth in British Columbia, 1950-64, at about 6% per year.

10. Data from Brewing in Canada (with supplement), appendix V and table VII.

11. From confidential data collected by the Brewers Association of Canada.
12. In Kappele, Wright, and Macleod, op.cit.


15. From Kappele, Wright, and Macleod, op. cit.

16. Data in this section are from confidential records of the Brewers Association of Canada.
CHAPTER IV

DECISION MAKING IN THEORY

Introduction

Decisions are made at all levels in the firm and are of varying degrees of complexity. Some decisions are trivial - such as deciding which magazines the company should subscribe to - and some are major ones - such as deciding whether or not to build a new plant. Many decisions are routine, but a few only occur once or very infrequently. Some decisions involve little risk - such as renting a duplicating machine - but others involve a great deal of risk - such as introducing a new product to the market. But whatever the nature of the decision, a decision-making process for dealing with problems is essential to the firm. In this chapter we shall develop a model of the decision-making process which we shall then incorporate into a general problem-solving model.

Classification of Decisions

There have been many classifications proposed for the different types of decisions. Initially we shall consider the classification proposed by Dale. Because this is a very broad classification, other categories within this classifi-
cation will be developed later.

Dale classifies decisions into three types: policy decisions, administrative decisions, and ad hoc decisions. **Policy decisions** are those which are made when the business commences its operations and are the principles governing the conduct of business. These decisions are often written in the policy manual. **Administrative decisions** are those concerned with the implementation of policies. These decisions translate the policy decisions into general courses of action. They may be formalized in the procedure manual. And finally, the third type of **ad hoc decisions** are the day-to-day decisions made at the place where the work is carried out.

**The Decision Maker**

Having presented one classification of decision types, we shall now consider whether or not we can classify the persons who make the decisions.

According to classic theory decisions should be assigned to the lowest competent level in the organisation. This is the lowest level at which "the jobholder has both access to all pertinent available information to the decision and the incentive to weigh the factors impartially". This is only a partial definition, however, because it implies a level of responsibility without questioning whether there is authority corresponding to the responsibility. In order that a jobholder may be an effective decision maker, the
authority that goes with his job must be commensurate with the responsibility of that job. This is essential because, as cited below, the actual decision (or deciding) is only one step in a process and the succeeding, and equally important, step is the implementation of the decision. This step cannot be carried out if authority is lacking. This factor is often overlooked in an organisation although the idea is not new. As early as 1926 Follet argued that "a person should have as much authority as goes with his function or task".  

From the previous paragraph it can be seen that policy decisions can only be made by the top management in an organization (such as the board of directors) because only they have the authority to implement such decisions. On the other hand, administrative decisions can be made at a lower level. The exact level will depend upon the structure and size of the organisation and may be either a department or division head. Ad hoc decisions are made by the first line managers and above.

This classification of who makes the decisions is not a rigid one because the distinction between policy, administrative, and ad hoc decisions, may not always be clear. The structure of the organisation and the type of industry will also have a bearing on the classification. What is important, in order to avoid duplicating decisions, is that
each decision maker in a particular organisation knows which decisions he can make himself and which ones have to be made by someone else.

The Process of Decision Making

The process of decision making is usually considered to involve a series of steps. The actual act of making the decision (or deciding) is but one step in the process and, in fact, if the preceding steps have been carried out with diligence, the 'deciding' step is usually self-evident and is of less importance than the other steps. In fact Drucker goes so far as to say that the emphasis in decision making should be on finding the right question rather than the right answer.

Because the act of making the decision is only one step in a process, some authors have called the process the 'decisioning process' to distinguish it from the 'deciding' step. In this thesis we shall use the term 'decision-making process' to refer to this series of steps. These steps will be outlined below. We shall refer to the person who makes the decision (that is, who selects the best alternative) as the decision maker. In some cases the person who ultimately makes the decision may not have been involved in the earlier steps. This is not important. However, what is important, as mentioned previously, is that the person who makes the 'deciding' step must have the authority to implement his
decision (the final step in the process). The term "theory of decision making" does not refer to the process of decision making (according to Dale and Edwards) but to the methods used, at one stage in the process, to evaluate alternative solutions to the problem. These methods will be examined later.

**A Model of the Decision-Making Process**

The decision-making process consists of anywhere from one to twenty steps depending upon the author. We will use seven steps in our model and the steps will be a combination of what we consider to be the best steps in the processes described by Duncan, Drucker, Kotler, and Simon. We will not describe their various steps because many of them are the same and a description of their models and our model will only lead to repetition.

The seven steps which constitute the decision-making process in our model are as follows:

1. **analyse the situation**
2. **define the problem**
3. **collect and analyse data**
4. **develop alternative solutions**
5. **evaluate the alternatives**
6. **select the best solution**
7. **implement the solution**

**1. Analysis of the situation**

The first step in the process is the analysis of the situation. Both Duncan and Drucker place this step after
the definition of the problem. The other authors (Kotler and Simon) tacitly place it in the definition step. It seems to this writer, however, that the logical sequence is first to analyse the situation, because only after an analysis can the problem be clearly defined.

The objective of the analysis step is to enable the decision maker to become well-informed about the elements in the situation. The nature of the problem should be examined. It should be determined whether the 'problem' (as yet ill-defined) belongs within the responsibility of the person making the analysis or whether it can be delegated or passed upwards. The real problem must be determined. The symptoms of the situation may be those of a subproblem and may not express the basic, underlying problem.

2. Definition of the problem

Having determined what the real problem is, it should now be clearly defined. This means that the objectives for the solution must be clearly thought through. They should be reasonable and attainable which means that consideration should be given as to whether or not the objectives are within the boundaries set by the rules and policies of the firm. Drucker suggests the use of four criteria for examining the problem. The first criterion is the futurity of the decision and is concerned with the time span for which the decision commits the firm to a course of action. The second
criterion is the impact of the decision on other areas and functions in the firm. Thirdly, the number of qualitative factors (particularly human beings) that enter into the decision should be considered. And lastly, the uniqueness or periodicity of the decision should be examined. By considering the problem in the light of these criteria, the decision maker can place the decision to be made in the right perspective with regard to the firm's viewpoint.

Once the problem has been defined it should be written down explicitly. If the definition is changed later as more data become available, the change should be made explicit too. During this stage it should be determined who must be consulted and informed about the problem in order that the process may be expedited.

3. Collection and analysis of the data

With the problem clearly defined the next step is to collect and analyse the data. Data collection is expensive and thus this step is left until the problem has been carefully analysed and defined. Thorough work in these two earlier steps can ensure that only relevant data is collected. This is why Drucker emphasized that asking the right questions is so important. The right questions will pinpoint the root of the problem and will guide subsequent research for data along the right tracks. Of course no one is infallible and the decision maker may find, after the data has been collected and analysed,
that the earlier two steps need to be repeated in order to find a better definition to the problem. The model is not rigid in the sequence of steps, and steps may be repeated as many times as is felt necessary and also some steps may be omitted.

Skillful and imaginative analysis of the data is an essential part of this step. When analysing the data the key variables in the problem should be identified. The major areas of uncertainty should also be outlined and the areas where data is lacking should be defined. This is important if the decision maker is to know the degree of precision and rigidity which he can afford to give his decision. One frequently used method of collecting data is the survey. We will examine this technique in detail in Chapter V, and also some statistical methods for analysing data.

4. Development of Alternative Solutions

The next step is very important - developing alternative solutions to the problem. A rule of thumb here is that if the decision maker can only think of one solution, then that solution is probably wrong. The only way to develop alternatives is to sit and think. A creative mind is an asset for this stage. A thorough search will probably unearth so many choices that it is just not practical to consider and evaluate them all. The skill of the decision maker - in considering the objectives of the decision and the relevant factors in
the problem - is needed here to discriminate on a preliminary basis and to exclude the unsuitable alternatives. Barnard stresses that in choosing from among alternatives primary attention should be given to those factors that are limiting, or strategic, to the decision. That is, to those factors which are strategic in determining whether the objectives of the decision will be reached. Only those alternatives which encompass the strategic factors should be considered. At this step, the alternatives are only listed and no evaluation (apart from the cursory evaluation to discriminate among the many choices) is carried out.

5. Evaluation of the alternatives.

Having listed the suitable alternative courses of action the next step is to evaluate them. The techniques used to evaluate the alternatives will depend upon the type of decision, the nature of the data, and the sophistication of the firm.

To facilitate describing the various techniques we will classify decisions according to Simon's method. He classifies decisions into programmed and nonprogrammed ones. These two types of decisions are the polar ends of a continuum along which all decisions fall. Decisions are classified as programmed when they are repetitive and routine and a definite procedure (or program) can be developed for handling them. Decisions are nonprogrammed if they are novel, unstructured, and consequential. There is no set method for handling these
types of problems because of their uniqueness or complexity.

If the decision can be classed as a programmed decision, then the decision maker should aim to develop a set procedure for dealing with similar types of problems. Formerly such problems were solved primarily through habit, standard operating procedures, or organisation structure. Today a more sophisticated technique may be used such as a logical flow diagram, a mathematical model, simulation, or a systems approach. We can list these techniques in the following diagram.

Figure 3. Traditional and Modern Techniques of Decision Making

<table>
<thead>
<tr>
<th>Types of Decisions</th>
<th>Decision-Making Techniques</th>
<th>Traditional</th>
<th>Modern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmed</td>
<td>Habit</td>
<td></td>
<td>Logical flow diagrams</td>
</tr>
<tr>
<td></td>
<td>Standard operating procedures</td>
<td></td>
<td>Mathematical models</td>
</tr>
<tr>
<td></td>
<td>Organisation structure</td>
<td></td>
<td>Simulation</td>
</tr>
<tr>
<td>Nonprogrammed</td>
<td>Judgment and experience</td>
<td></td>
<td>Heuristic program-</td>
</tr>
<tr>
<td></td>
<td>Management principles</td>
<td></td>
<td>ming</td>
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</tbody>
</table>

Programmed Decisions: Traditional Methods

Habit is formed through repetition and thus repetitive decisions tend to lead to habit forming methods for their solution. Such methods rely on the factual knowledge and experience of the firm's staff, and when a member of the staff leaves the firm the cost of providing his replacement with training and experience can be very large.

An improvement is made on habit methods when the habits become recorded. They are then known as standard operating procedures. The only difference between habits and standard operating procedures is that the latter are formal, written programs. That is to say, they are decision rules. The advantages of standard operating procedures are the reduction in costs associated with indoctrinating new members into the firm, and the opportunity for modification and improvement afforded by exposing habitual patterns to scrutiny.

Organisation structure is also a method in so far as it establishes expectations and subgoals which serve as criteria of choice. It also breaks down problems into component parts, through the delegation of responsibility for decisions, when appropriate.

Programmed Decisions: Modern Methods

The modern methods for solving programmed problems arose largely out of the needs of World War II for techniques
to solve increasingly complex, although often routine, problems. The development of the computer during the war aided the application of mathematical methods.

When problems become more complex and require several decisions to be made, a logical flow diagram may be used. This is essentially a sequence of decision rules and, by representing them in diagramatic form, clarity is added to the decision making process. There are two basic operations which link the decisions in a flow diagram. One operation is called branching and this occurs when there are alternative courses following a decision. The other operation is called looping and this occurs when the course of action following a decision is to return to an earlier decision step. Magee has developed a special type of flow diagram based on branching called the decision tree. This procedure is best suited to a situation involving a sequence of decisions and/or where there are more than three chance variables affecting decision alternatives in different ways. The decision alternatives are listed at the far left and branches are used to depict the set of possible events that could follow each decision (see Figure 4).

For even more complex problems a mathematical model may be used. The development of operations research techniques - such as linear programming, dynamic programming, and integer programming - has greatly aided in solving complex
FIGURE 4. Decision Tree for Problem on Size of Salesforce

market potential 3000

competition reacts

competition doesn't react

market potential 5000

competition reacts

competition doesn't react

hire 8 salesmen

hire 4 salesmen

market potential 3000

competition reacts

competition doesn't react

market potential 5000

competition reacts

competition doesn't react

problems. In a linear programming model the objective function and the constraints are expressed as straight-line relationships. If it is felt that the relationships are not linear, then nonlinear programming is used. These models are considerably harder to solve and so for simplicity, relationships are often assumed to be linear. Dynamic programming is the most complicated of the programming techniques and is applied to those problems where a series of consecutive, interdependent decisions have to be made. Integer programming is a technique used to ensure that the optimal solution consists of integers rather than fractions.

These methods often require "high-level" mathematics for their solution, and a computer may be used for the calculations. Sometimes the problem is too complicated to be represented by a standard mathematical model. For such problems the technique of computer simulation is being increasingly used. The problem is first stated as a set of mathematical or logical relations which represent the essential features of the system. The computer then carries out step-by-step computations with these relations which imitate the manner in which the real system, being simulated, might perform. The values of the variables are changed and the calculations reiterated many times. The most likely solution is then selected.
A technique which extends beyond the manager's point of view and looks at problems from the total company viewpoint is the systems approach. This is not a specific method for decision making but rather is a procedure for examining the process of problem solving as a whole.

The term 'system' may refer to the total organisation, to a functional area within the organisation, or to an aspect of the functional area. Whatever the system refers to, it is always composed of several elements. These elements may be grouped into five classes: 1) input, 2) output, 3) transformation, 4) control, and 5) feedback. In a large complex organisation, different parts of the decision-making process may be performed by different personnel and thus consideration of these elements allows useful analysis of decisions.

The input element represents data received from outside the system (either from other systems within the firm or from outside the organisation). The transformation element is concerned with the transformation of the input element into the output element (usually a plan of action). The transformation may be performed by individuals, groups, or machines. The method of transformation is governed by the control element (which may consist of decision rules, company objectives and policies, programs, models, and so on). One important feature of the systems concept is the feedback element. This is the flow of data back to the system concern-
ing the results after the decision has been implemented. Such feedback allows adjustments to be made to the system in order to make future decisions more effective.

Nonprogrammed Decisions: Traditional Methods

Nonprogrammed problems, as their name suggests, are problems that cannot be solved by a specific, programmable technique. Instead we have had to rely in the past on what we have called judgement and experience, or on management principles.

The judgement and experience technique, if it can be called a technique, is rather vague and the psychological processes behind it are still not very well understood. However, many nonprogrammed problems are solved by using this technique. There are several reasons for its wide spread use. For day-to-day problems decisions may be required quickly and there may not be time to apply more rigorous scientific analysis. This supposes that there are scientific methods for solving these problems, but in many cases this is not so. And even if such methods are available, it may be more expedient from the economic and the time point of view not to use a scientific method. The time and expense involved in developing an analytical solution may not be justified by its contribution to the decision.

Decisions based on experience and judgement are subject to the limited experience of the decision maker and to the extent of his memory and his powers of observation.
They are also limited to his interpretation of the problem, and if his interpretation is wrong it may mean the application of judgement based on an irrelevant experience.

Management principles are "rules of thumb" that have evolved from experience but which have been made more explicit than in the above technique. They may be written down or they may be tacitly acknowledged by management. Such principles can also be developed through experimentation, under controlled conditions, through research by observational and experimental means, or through deduction from general theories. As in the preceding technique, management principles are limited by the interpretation of the problem.

Nonprogrammed Decisions: Modern Methods

Ill-structured problems generally have the following characteristics:

1) the objective or goal of the problem is not well defined or is non-quantifiable

2) many of the independent variables are qualitative, symbolic or verbal rather than quantitative

3) computational means or algorithms are not available.

To help solve these types of problems a technique called the heuristic problem solving method has been developed. This technique attempts to simulate the processes of human problem-solving. Several studies have been carried out to determine the nature of human problem-solving processes and advances have been made but progress is slow. What has emerged so
far is that human thought-processes essentially appear to go through three processes when trying to solve a problem: the problem is first classified into a type; the problem is then broken down into subproblems if the larger problem cannot be solved; and lastly, techniques are applied to solve the subproblems. The heuristic technique based on these processes is shown schematically in Figure 5.

FIGURE 5. Heuristic Programming Procedures

Start

→ Classify the (sub)problem ← Next (sub)problem

→ Apply a problem-solving technique

Successful?  YES → Solution of → Last (sub)problem? (sub)problem

NO

All techniques tried?

YES

Attempt to break down the (sub)problem

YES

Successful?  NO → Incomplete solution

End

The problem-solving technique which is applied to a subproblem is any of the previously mentioned techniques that will solve the problem. The subproblem is classified in order to aid the decision maker in selecting the most appropriate problem solving technique for that type of problem.

The heuristic technique does not guarantee a solution - this depends on solving all the subproblems. Neither does it guarantee the optimal solution because there may be suboptimisation of the smaller problems. However, it can lead to a satisfactory and effective solution to very complex problems.

6. Selection of the Best Solution

The fifth step in the decision-making process is the selection of the best alternative that will contribute most to the attainment of the objectives set for the decision. Various ways of doing this have been suggested by different authors. Drucker suggests four criteria for picking the best solution: 1) risk, 2) economy of effort, 3) timing, and 4) limitations of resources. The first criterion entails weighing the risks of the decision against the expected gains. Although Drucker does not elaborate on the types of risk, we shall see later that risks may be classified into three categories. Drucker's second criterion is concerned with the course of action which will give the greatest gains, or the needed change, with the least effort or the least disturbance.
to the organization. Implied in this criterion is the notion of looking at the decision from the firm's point of view in order to minimize suboptimisation. The third criterion, timing, deals with how quickly the decision must be implemented and whether it is to be final or not. The last criterion considers whether the necessary resources (particularly qualified people) are available to implement the decision. Koontz and O'Donnell\textsuperscript{24} stress that the tangible and intangible factors must be weighed when selecting the best alternative. The tangible factors can frequently be quantified which makes comparison between alternatives straightforward. Intangible factors, however, are usually qualitative and judgement is required to make comparisons. Koontz and O'Donnell state that there are three bases for selecting alternatives: experience, experimentation, and research. Experience, based on past successes and mistakes, may not always be applicable. Experimentation is expensive and should generally be used only after other techniques have failed, although in some cases it is necessary. Research, to establish the limiting variables and parameters that bear on the solution, may enable a selection to be made at less cost than by experimentation and more scientifically than by experience.

A more sophisticated method for selecting alternatives has evolved from game theory.\textsuperscript{25} The purpose of the theory of games is to analyse mathematically a general class of problems, called strategy problems, by studying games. Game theory
recognizes that competitors have strategies which must be taken into account in order for an individual (or firm) to attain the best solution to a strategy problem. Under these circumstances game theory attempts to work out the optimum strategy that an individual (or firm) can follow in a certain situation so that, no matter what the competitor does, he (or it) can minimize the maximum expected financial loss.

From the theory of games come various principles or criteria which may be used to select alternative decisions (or strategies).

Before these criteria can be used, however, there is one more aspect of decisions to examine first. When an individual (or firm) makes a decision there are two classes of factors which may prevent the decision from achieving its objectives. One class contains the competitors' strategies which we have already discussed. The other class is called the state of nature. This class contains the natural and society factors which affect the outcome of a decision. Any specific combination is called a state of nature. Both these classes of factors are uncontrollable from the point of view of the decision maker.

The states of nature or the competitive strategies may occur in three forms depending upon how much we know about them. These three forms are certainty, risk, and uncertainty. If a decision is made under a condition of certainty, then the state of nature (or the competitive strategy) which will occur is known with certainty. If there are several states of nature
(or competitive strategies) but the decision maker knows the probability of occurrence of each state, then the decision is said to be made under a condition of risk. In the third form, uncertainty, the probabilities of occurrence of the various states of nature (or competitive strategies) are not known. This condition is sometimes therefore called ignorance. These distinctions of form are made primarily to ascertain the appropriate criterion to be used.

The most frequently used criteria to help select the optimum among the alternatives are the expected value, the expected utility value, the Laplace criterion, the criterion of pessimism, the criterion of optimism, the alpha criterion, \(^{28}\) and the regret criterion.

Condition of Certainty

Under conditions of certainly there is only one state of nature or competitive strategy. The task of selecting the best alternative is therefore simply one of selecting that alternative which provides the highest return in terms of the objective of the decision.

Condition of Risk

When the decision is made under a condition of risk, one of two criteria are frequently used. The two criteria are the expected value of the decision and the expected utility value of the decision. \(^{29}\)
The expected value of an event is the value if it occurs (the conditional value) multiplied by its probability of occurrence (i.e. the probability of the state of nature). In a set of alternatives, that alternative is chosen which has the highest expected value. This is based on the fact that if the decision maker has many such decisions and the conditional value and probabilities remain the same, then over the long run the selection of the decision with the greatest expected value will lead to the objective with the maximum value.

However, if the decision does not occur very often and if the decision is likely to have a large impact on the firm (in terms of a large gain or loss), then the decision maker may prefer to use the utility theory of the economists and to maximize his expected utility rather than his expected (monetary) value. In this technique utility values are assigned to the outcomes of decisions in place of monetary values. This allows recognition to be given to the fact that a certain sized loss, if it occurred, would be crippling to the firm.

Condition of Uncertainty

Both of these criteria are suitable only when the decision is made under a condition of risk in which the probabilities of the states of nature occurring are known. When these probabilities are not known, we have a condition
of uncertainty. It is under this condition that the criteria developed from game theory have been extensively used. All of the criteria require that conditional values be derived for the outcomes. The different criteria then handle the conditional values in the following ways.

If the decision maker has no reason for supposing that one state of nature (or competitive strategy) is more likely to occur than another, he may decide to use the Laplace criterion (also known sometimes as the criterion of rationality). This technique applies equal probabilities to the various states of nature, and the expected value of the decision is then calculated as previously explained by multiplying the conditional values by the probabilities. The decision with the highest expected value is then selected.

If, however, the decision maker tends to be pessimistic by nature, he may prefer to use the criterion of pessimism (also known as the minimax criterion\textsuperscript{30}). This criterion looks at the pessimistic side of the decision, assumes that the worst state of nature or competitive strategy will occur, and attempts to minimize the maximum possible loss under such conditions. The alternative which achieves this is therefore selected.

Many people are optimists, however, and if the decision maker is such a person and is optimistic about which state of nature or competitive strategy will occur, then he will probably choose the criterion of optimism (also known
as the maximax criterion\textsuperscript{31}). This criterion leads to the selection of the alternative which has the maximum possible gain on the optimistic assumption that it will occur.

A valid criticism of the two preceding criteria is that not everyone can be categorized as either a pessimist or an optimist. In fact, the majority of people probably fall between these two extremes and at different times tend towards either one. Hurwicz\textsuperscript{32} therefore proposed a combination of the two criteria which has been called the Hurwicz alpha criterion\textsuperscript{33}. This criterion assumes that the decision maker has some degree of optimism. This degree of optimism is expressed on a scale from 0 to 1. If he is completely optimistic about the occurrence of a state of nature he would specify 1 on the scale. If he is completely pessimistic about the occurrence he would specify 0. For any other feeling he would choose a decimal between 0 and 1. He then multiplies the conditional value under the most optimistic state of nature for each strategy by his coefficient of optimism. Next he multiplies the conditional value under the most pessimistic state of nature for each strategy by his coefficient of pessimism. Finally these two values for each strategy are added together to give an index for each strategy. The strategy with the highest index is then selected as the best.

A fifth criterion may be used for decisions under uncertainty, namely the criterion of regret (also known as the minimax regret criterion\textsuperscript{34}). The regret of a strategy
is defined as the difference between the gain from that decision and the maximum gain that is possible under the same conditions. The decision maker calculates the difference between the maximum and minimum outcomes for each alternative under each state of nature or competitive strategy. He then lists the maximum regret that could occur for each alternative, and selects the alternative which has the minimum such maximum regret (the minimax).

**FIGURE 6. Criteria for Selecting the Best Alternative**

- **Under conditions of certainty**: Select decision with optimum outcome
- **Under conditions of risk**: Select decision with greatest expected value or expected utility
- **Under conditions of uncertainty**: Select criterion Laplace Maxmax, Minimax, Minimax regret, Hurwicz alpha
  - Select decision with outcome best meeting criterion

Figure 6 shows the various criteria that may be used to select the best alternative. The selection of the criterion to be used for alternatives under a condition of uncertainty is left to the judgement of the decision maker. Attempts have been made to develop a set of criteria-evaluating criteria. In one set, devised by Milnor, the criterion of regret satisfied more of his criteria than did the other four criteria which we have presented here. Generally, however, it can be said that there is no single best criterion.

7. Implementation of the Solution

The final step in the decision-making process is implementing the decision. Little can be said about this except to reiterate what we said earlier, that the decision maker (the one who selects the best alternative) should be the one who implements the decision.

A General Problem-solving Model

The decision-making process which we have described is the step-by-step process for handling a particular problem. To be of practical use to the decision maker who is faced with many problems during the day, our model has to be expanded (see Figure 7).

When the decision maker is faced with several problems that need to be solved he should approach them in a methodical manner. After a preliminary analysis of the problem
FIGURE 7. A Model for Solving Managerial Problems

Start

Select problem from 'intray'

Preliminary analysis

Can problem be delegated? yes Delegate and set a deadline
no

Can problem be programmed? yes Assign research to develop a decision model
no

Can problem be solved at later date? yes Place on calendar for future action
no

Last problem in 'intray'? yes Initiate decision-making process
no

Set aside in 'pending tray'

Develop alternate solutions

Evaluate the alternatives

Select best one

Implement decision or defer till later date

Last problem in 'pending tray'? yes Stop

no

(which should last only a few minutes), the decision maker must decide whether or not it can be delegated. If it can be, he delegates the problem and sets a time limit for its solution. If it can not be delegated, the decision maker determines whether the problem is routine or repetitive and hence whether it can be programmed. If it can be, he assigns the problem to someone (perhaps the research department) to develop a decision model. Should the problem be a non-programmable one, the decision maker has to decide on its urgency. If the problem can be left until a later date, then it is 'shelved' and a date is set for future action. If the answer has been 'no' to all these queries, the problem is put in the "pending tray". The decision maker then returns to the remaining problems and repeats these steps. Eventually he will have no problems left except those in his "pending tray". He now starts to work on these, proceeding through the steps of the decision-making process as we have described them.

Summary

The model of the decision-making process presented here is an attempt to provide a logical, step-by-step procedure for analysing and solving problems. The sequence of steps is not a rigid one. Steps may be omitted, or reversed, or repeated several times as the decision maker gains insight into the problem and strives for its solution.
This model, however, is essentially designed for dealing with one problem at a time and may be time consuming for the more trivial problems. To overcome this, the decision-making model is incorporated into a problem-solving model. This latter model outlines a procedure for dealing with several problems, still one at a time, but in a manner which will expedite the total time required for their solution.

FOOTNOTES


14. For further discussion of these types of decisions see James G. March and Herbert A. Simon, Organisations (New York: John Wiley and Sons, Inc., 1958), pp.177-180.


17. See for instance Robert D. Buzzell, Mathematical Models and Marketing Management (Boston: Graduate School of Business Administration, Harvard University, 1964).


CHAPTER V

DECISION MAKING: THEORY VERSUS PRACTICE

Introduction

The decision variable over which the breweries have most control is, as previously mentioned, the product. Consequently strategies are always being sought which use this decision variable to gain a competitive advantage. At the same time a close watch is kept on competitors' strategies.

In Chapter III it was pointed out that styling improvement is a frequently used modification strategy in the brewing industry, with changes in the package being the commonest type of improvement. In this chapter we shall discuss a styling improvement which was used by one of Molson's competitors. We shall examine the consequent problem which arose for Molson's, and how they went about finding a solution. We shall use the problem solving model which we developed in Chapter IV as a framework for examining how closely Molson's decision-making process corresponds to our model (see Figure 7, page 68). That is to say, how well does the practice of problem solving in Molson's relate to the theory.

Much of this chapter will be concerned with describing a survey which was used by Molson's, at the third step of the decision-making process, for the collection and analysis of data. This description will complete the discussion of
the various techniques which may be used in the decision-making process.

**Origin of the Problem**

Although a brewery is limited in the changes which it can make to the package (or carton, as it is known in the brewing industry) - for distribution convenience the overall dimensions are standardized throughout the industry - the method of opening the carton, the type of handle used, the use of separators between the bottles, and other such features, are open to changes. This allows some differentiation of an otherwise fairly homogeneous product and so the breweries understandably show considerable interest in this aspect of the product decision variable.

In January 1968 Labatt's introduced a new, zip-type top for use on its twelve bottle cartons. Up to that time the method of opening the cartons was by taking hold of one end of the top, which was perforated along all edges, and tearing it off either partially, or completely (if all bottles were to be removed). As the top was torn back both rows of bottles were uncovered. Labatt's new top had a thin perforated strip running the length of the box in the centre of the top. To open the top, the zip was completely torn off. This left the two rows of bottles still covered, and either side could then be opened by unfolding the two remaining flaps.
which were lightly held in place. Labatt's claimed ease and speed of opening as features of their new top.

The Decision-making Process

Practice Normally a situation like this would be brought to the attention of Molson's marketing manager through the weekly reports of the salesmen, or from the observation of one of Molson's employees. In this instance, however, there was a leak of information through a visiting representative of one of the packaging companies.

After hearing about the new carton, and before it had been introduced to the market, the marketing manager talked to the vice-president of Capilano. It was decided that, as Molson's had no immediate plans for changing their carton, any further decision should wait until there was some feedback on consumer opinions about the new carton. Accordingly the matter was set aside for the time being.

Theory It can be seen that the above procedure explicitly went through two steps in our model - preliminary analysis of the situation, which led to the decision being deferred until a later date. Implicitly the procedure went through two other steps before the decision was set aside. Preliminary analysis showed that the 'problem' was not a routine one and therefore it could not be programmed. Furthermore the 'problem' could not be delegated because changes in carton design have to be authorized by the marketing manager.
The only difference between the procedure in practice and our model is that no deadline was set for future action as is specified in the model. It seems advisable to set a definite date for review of the problem as this prevents the problem from being pushed back too far and ensures that some future action will be taken on a specified date.

Practice After two months there had been a fair amount of feedback from the consumers. On the whole the reports were favorable - people liked the easy method of opening the carton. The marketing manager therefore contacted the vice-president of Capilano to discuss the situation and to decide what should be done about it. It was decided that more information was needed about the new top - particularly about its acceptance by the consumers. Information was also needed about any faults that the new carton might have, together with any suggestions that consumers might have regarding improvements. The marketing manager suggested that a survey should be conducted in order to determine this information. Accordingly permission was sought, and granted, from the divisional office in Calgary.

Theory Having decided that it was now time for action, the procedure described above went through the first two steps of the decision-making process in the lower half of the model. The first step, further analysis of the situation, led to the problem being explicitly defined as "Will Molson's share of the
market suffer because of Labatt's strategy?" The situation could now be called a problem, and the third step in the process, collection and analysis of data, could be implemented. The objective of the solution was "to maintain Molson's market share".

Before continuing to describe the remaining steps in the decision-making process, we will first describe in detail the method used to collect and analyse the data.

The Survey

As mentioned above, it was decided that a survey should be conducted to gather data for the problem. The writer was asked to design a questionnaire, and then to conduct the survey and analyse the results. After the questionnaire was designed, it was submitted to Molson's for comments. It was accepted for the survey with two minor alternations.

The survey was conducted, over three days, from the 13th to 15th June, 1968, at the Villa Motor Inn in Burnaby, British Columbia. The general purpose of the survey was to determine whether the type of carton top has any impact on the purchasers of bottled beer. Specifically the objectives of the survey were to find out:

1) Whether the zip type of top, as used by Labatt's, has any influence on why people choose Labatt's;

2) whether present purchasers of those brands using
the non-zip type of top (Carling's, Molson's, and O'Keefe's) would prefer to see the zip top used by their favorite brands;

3) whether people have any comments about the cartons in general.

A rented step-in van, equipped with a table and chairs and plain sample cartons of the two types under investigation, was used for the survey. The van was positioned close to the beverage room and the respondents were approached as they entered or left the room. Co-operation on the whole was good.

Only seven women, out of a total of 100 respondents, were included in the survey. This was because, after approaching several women, it was found that few of them bought bottled beer themselves but instead left it to their husbands. Although there are no statistics available, the proportion of one woman to about fourteen men is probably near the true proportion of women/men that buy bottled beer. Also it was found that of these seven women, four were uncommitted to any particular brand (that is, they had no favorite brand). Although there were nine uncommitted respondents and their interviews tended to be rather negative - these respondents generally had few opinions.

As there were no previously established proportions with which to compare the survey results, the data were analysed by deriving confidence intervals from estimations of the proportions (see Appendix III for data and analysis). Questions 4, 5, 10, 11, and 13, were analysed using this
technique.

Some of the questions, for example numbers 1, 2, 6, 7, 8, 9, and 14, were not statistically analysed, either because such analysis would not be meaningful or because the samples were too small to give reliable results.

It was found that statistical analysis of some of the questions was hindered by the small size of the subsamples. For instance, in question three, it would be interesting to know if those respondents whose favorite brand was Old Style were more loyal to that brand than the other respondents were to their favorite brands. A test of the difference between the proportions would indicate whether this was true or not, but the small size of the subsamples precludes any meaningful results. Similarly in question eleven it would be interesting to see if there is any significant difference between the answers given by the drinkers of Molson's brands and those given by the other respondents. A chi square test could show this, but again the smallness of the subsamples makes any conclusions unreliable. Examples can be found for other questions.
The Questionnaire and Results

A copy of the questionnaire will be found in Appendix II. The results will be found in Appendix III.

The first question was designed to find out whether the respondents were suitable for the survey or not. The terms 'often' and 'sometimes' are subjective terms and their meaning differ from person to person, and so they cannot be used as reliable indicators of the frequency with which the respondents buy bottled beer.

The second question was asked in order to determine whether or not beer drinkers tend to have favorite brands and if they do, to determine which brands are favored the most. The respondents, who had a favorite brand, were also asked whether they knew the name of the brewery which made their favorite. This was to measure the awareness of the respondents to the brewery which made his favorite brand. If the respondent had no favorite brand (i.e. he was uncommitted), the next question which he was asked was number six.

The answers to the second question showed that there were nine respondents in the sample who were uncommitted to any particular brand. The other respondents favored Molson's, Carling's, Labatt's and O'Keefe's, in that order. Of these 91 respondents, 70% knew the name of the brewery which made their favorite brand, and the remaining 30% were either uncertain or did not know. From these percentages it
seems that the majority of beer drinkers are aware of the brewery which makes their favorite brand.

Question three was asked in order to determine the respondent's loyalty to his favorite brand; that is to say, whether or not he was firmly committed to a particular brand. The answers to this question might give an indication as to the percentage of the market that might be persuaded to change their favorite brand. The results show that only 57% of the respondents 'always' asked for their favorite brand, while 36% asked for it 'most of the time' and 7% asked for it 'sometimes'. This appears to indicate that there is 43% of the market which might be persuaded to change from their favorite brand.

The fourth question was designed to find out whether the respondent could remember the way in which the carton of his favorite brand opens. From this question it was hoped to establish the degree of importance of the carton top, as a feature, to beer drinkers. From a hypothesis test of the results, statistically 95% of those people who have a favorite brand can describe the way in which the carton opens. Thus the top appears to be a significant feature of the carton, and any change by Molson's would be noticed (at least by Molson's customers).

The fifth question, which only applied to those whose favorite brand uses the non-zip top (henceforth these respondents are referred to as non-zip users in this paper)
was designed to measure the awareness of non-zip users to the new zip top. It was found that, despite the fact that the new zip top had been on the market for six months at the time of the survey and it had been extensively advertised by Labatt's, a hypothesis test indicates that, statistically 60% of the non-zip users are unaware of the zip top. This would appear to reflect on the effectiveness of Labatt's advertising program. The results of this question have implications for question eight.

Question six, which only applied to the uncommitted respondents, was asked in order to determine whether or not the type of carton top was a sufficiently important feature for them to remember it. The results show no trends and no further analysis appears meaningful.

In order to determine experimentally which of the two cartons the respondents found easier to open, they were all given an opportunity to open a sample of each in question seven. To help diagnose what aspects of the two types of tops the respondents liked or disliked, they were asked for comments about the tops. The answers show that 90% of the respondents found the zip top easier to open than the non-zip top. In fact, however, from the comments that the respondents made at the time, some of the seven who replied that they found the non-zip easier to open were in fact measuring their familiarity with, or preference for, the
non-zip top. If this was the case, then the figure of 90% should probably be higher.

The next question, which applied only to zip users who answered in the preceding question that they found the zip top easier to open, was basically to find out if any of the respondents had changed to their present favorite brand because of the type of top. All of the respondents answered that the top had no influence on why they drink Labatt's. None of these respondents had switched from another brand. However, as indicated in question four, only 40% of non-zip users knew about the new top. Therefore the smallness of the sample in this question together with the indications from question four, cast doubt on the reliability of any conclusions.

Question nine was asked for the technical reason that removal of the flaps facilitates the repacking and storing of the empty bottles. The answers show that the majority of the respondents never tear the flaps off. This information may be of use in future carton designs, although again the smallness of the sample size casts doubt on the reliability of any conclusions.

A possible inconvenience with the non-zip top is the disposal of the top. Question ten was asked in order to determine whether in fact the respondents did find this to be an inconvenience or not. The results of a hypothesis
test indicate that, statistically 50% of non-zip users do find it inconvenient to dispose of the top.

The next question, number eleven, was designed to measure the respondent's preference for the two types of top. A hypothesis test indicates that, statistically 80% of the people who buy bottled beer would prefer the cartons to use the zip top. There was a high preference of 'no opinions' to this question.

The last three questions were general ones to find out what aspects of the cartons the respondents did not like, what their views were about the handles, and whether they had any suggestions for improvements. Generally the respondents had criticisms of only a few features and were unimaginative regarding changes. Statistically, 35% of those people who buy bottled beer find nothing wrong with the cartons, but 55% of the people who buy bottled beer have a complaint about the handle (usually that it was too weak). When the respondents were asked if they would recommend any changes to the cartons, apart from wanting the zip top and stronger handles, 57 recommended no changes and the majority of the others suggested dividers between the bottles.

Reliability of the Survey

The reliability of the survey may be questioned on three grounds: its representativeness of the universe from which the sample was drawn; the size of the sample; and the
possibility of bias in the questions.

Because the survey took place at only one location, the sample can only be claimed to be representative of the population who drink at the Villa Motor Inn. This population may not be representative of the people who buy bottled beer at the main liquor outlets (the liquor stores). An indication that this may be the case is given by the percentages in question two which differ slightly from the market share figures for the breweries. However, this bias could not be overcome because it is against the law to conduct surveys inside or outside liquor stores.

Many of the subsamples are too small to be able to draw any reliable conclusions and so in general, no attempt was made to analyse those questions containing small sub-samples. In order to obtain subsamples of sufficient size that some confidence could be placed in conclusions based on them, a sample size of about 500 - preferably at five different locations - would have been required. However, this would have meant both extra time and extra expense. It was felt that a sample of 100 at one location was adequate for Molson's purposes.

The questions appear to be free of bias. In question four, the word 'top' may be thought to be leading, but as all cartons in British Columbia open at the top this is not a leading question. Similarly in questions five and
six, the word 'top' may be considered to be leading, but as the top is the only distinguishing feature between the two boxes again there is no bias. In fact, the word 'top' focusses the attention of the respondent who might otherwise reply 'no' to the question because he does not, at the time, observe the different tops. For continuity in the questionnaire, questions five and six might be better placed after question seven. However, the only really desirable alteration in the questionnaire should be in question eight. This direct question may automatically get the response 'no', whereas an indirect question might be able to uncover hidden feelings.

Validity of the Survey

It is hard to judge the validity of the survey because of the lack of published data with which to compare results. However, the survey method seems a valid way to collect the required data, and the questions seem relevant for the purpose of the survey. The questionnaire was too short to build in any checks of the answers, but nevertheless, the data is probably as valid as is necessary for the purposes of the survey.

Conclusions to the Survey

Recognising the possibility that the survey may not be totally reliable and valid, the following tentative
conclusions regarding the objectives set at the beginning of
the survey may be reached:
1) The smallness of the subsample of respondents who drank a
Labatt's brand and the fact that only 40% of non-zip users
knew about the new top, precludes any reliable conclusion
being reached regarding whether or not the zip-top has any
influence on why people drink Labatt's.
2) From the experiment with the samples, 90% of all beer
drinkers find the zip top easier to open than the non-zip
top, and 80% of all beer drinkers prefer the zip top
because of its ease of opening, its neatness, and the small
amount of cardboard that has to be disposed of.

The top, as a feature of the carton, is sufficiently
significant that any change by Molson's would be noticed,
at least by Molson's customers. From the experience of
Labatt's, a considerable effort would have to be made in
order to make drinkers of other brands aware of the change.
The effort may not be worth it because there is 53% of the
market which is not firmly committed to any one brand. The
strong preference shown for the zip top, and the fact that
50% of non-zip users find the non-zip top inconvenient to
dispose of, may act as hidden persuaders to capture this
segment. However, as mentioned in the previous paragraph,
there is lack of conclusive evidence to confirm whether or
not people would change to Molson's because of the top.
3) Nearly half of the people (45%) who buy bottled beer have no complaints about the carton while 35% complain that the handle is too weak or too thin. When specifically asked about the handles, if not already mentioned, a further sixteen respondents said that the handle was too weak. Thus, overall, 35% of the people have no complaints at all about the box while 55% find the handle unsatisfactory. Regarding improvements to the cartons, 57 respondents recommended no changes while 24 suggested dividers between the bottles.

Having described the survey and its results, we can now continue to follow Molson's steps through the decision-making process. The steps which they actually took are confidential because their final decision has yet to be implemented. The remainder of this paper will therefore be hypothetical in content and will describe how a solution might be arrived at if the steps outlined in our model are followed.

**Development of Alternative Solutions**

The next step after collection and analysis of data, is the development of alternatives. The problem, as previously mentioned, was defined as "Will Molson's share of the market suffer because of Labatt's strategy?". The results of the survey indicate that the answer to this question is probably 'no', but the results are not conclusive. The objective of the solution is to 'maintain Molson's market share'. With the
results of the survey and the objective of the solution in mind, we can set about developing alternatives. After some consideration there appears to be four alternatives which merit further attention.

One alternative, bearing in mind the inconclusive results of the survey, is to do nothing but wait for a few months in order to see whether Labatt's definitely gain in market share as more non-zip users become aware of the zip top.

However, although the results of the survey are inconclusive, they did indicate that people prefer the zip top and so if Molson's wish to be safe, they could come out with an identical carton to Labatt's as one solution.

An alternative solution would be to retain the zip feature of Labatt's design, but to add some new features - such as a stronger handle and dividers between the bottles - so that people will not think that Molson's are just copying Labatt's design.

A fourth solution would be for Molson's to design a completely new carton.

Evaluation of the Alternatives

Because this problem is of the nonprogrammed type we have to rely on judgement and experience to evaluate the alternatives.

The first alternative suggested is to do nothing. This does not seem to be a good solution, however, because
even if Molson's market share does not decline, the over­whelming preference shown for the new top suggests that its use by Molson's would at least create goodwill. This is a valuable asset and it may help to attract new customers.

The next solution is to copy Labatt's design directly. This is possible because it is very hard to patent carton features. However, some of the goodwill that might be gained by using the zip feature could be lost if people think that Molson's is merely copying Labatt's design.

An alternative solution to this last one is to retain the zip feature but to add some extra features to the design. The carton will then derive any goodwill that the zip feature might bring but at the same time the design will be distinct to Molson's products, and people will not think that Molson's are only copying Labatt's. The extra features, which the survey showed people wanted, should enhance any goodwill generated by the zip feature.

The fourth alternative is to come out with a completely new design. However, new designs take a long time to develop and there is no guarantee that such a design will be successful, whereas the zip design has been proven popular.

Selection of the Best Alternative

To select the best solution we shall follow the advice of Koontz and O'Donnell and carefully weigh the tangible
and intangible factors of each alternative (see Chapter IV). The intangible factors seem to be particularly important in this problem. Experience and the research findings of the survey will be our main guidelines in judging the merits of these factors. After careful consideration it appears that the third alternative is the best solution.

**Implementation of the Decision**

Not much can be said here about this last step in the decision-making process except that, in order to forestall the possibility of Labatt's increasing their market share as more people become aware of the zip top, Molson's should implement their decision as soon as possible.

**Summary**

It appears that the process of problem solving as practised by Molson's follows the theory fairly closely, at least in the early stages. The only criticism of the practice is that some of the steps are made implicitly. This may lead to steps being missed out. In order that the maximum benefit be derived from the logical sequence of steps in the problem solving model, it is recommended that each step be made explicitly.
FOOTNOTES


2. The questionnaire was designed after consulting several books on the subject. One particularly helpful one was by Stanley L. Payne, The Art of Asking Questions (Princeton: Princeton University Press, 1951).

CHAPTER VI

SUMMARY AND CONCLUSIONS

In this thesis we have examined some of the marketing problems which confront the brewing industry in British Columbia. We have investigated the marketing environment which is the cause of most of these problems and we have discussed some of the means by which the brewing industry can overcome them.

Generally we have seen that the nature of the brewing industry is largely determined by the legal regulations which control three of the industry's four marketing decision variables. Thus the breweries have only one variable over which they have any measure of control, and because of the homogeneity of the product this variable is in fact largely ineffective. It would seem that the brewing industry should be in revolt.

However, what at first sight appears to be excessive interference by the government on closer examination does reveal some benefits. The regulations concerning advertising mean that the breweries are limited in how much they can spend and this tends to encourage creativity while keeping costs down. In most industries today advertising is an increasing costly expense. Similarly the regulation control-
ling the price of beer can be regarded as a blessing in that it prevents price warfare. The regulation of distribution is the one area which would benefit the industry if the government were to relinquish control. The present system ensures that the distribution of bottled beer is mainly limited to the liquor stores and hence choice of outlets is restricted. Even more serious from the industry's point of view, however, is the fact that because the government controls distribution it adds its own mark-up to the price of beer (at present 19% of the selling price) as well as charging sales tax. The effect of this mark-up is to raise the price of beer to the consumer which in turn limits the growth of the brewing industry. The industry may benefit to some extent in that bulk shipping to one point in an area saves costs. However, this is insufficient cause to justify government interference when the deleterious effects are considered.

Thus, the only regulations which the brewing industry would really like to change are those governing distribution. In order to change these the industry must make representation to the government. However, the government, which gets 7% of its total revenue from the sale of beer, is not going to relinquish control without a fight.

The model which we developed in Chapter IV brings together the several activities which are involved in the process of decision making and arranges them in a logical
order that will lead the decision maker towards a solution. However, as was emphasized at the time, the order is not a rigid, unidirectional one, and steps may be reversed or omitted if the decision maker feels that this will lead more effectively to a solution.

This model is essentially concerned with solving one problem at a time. To expedite the handling of several problems, although still only one at a time, the decision-making model was incorporated into a general problem solving model. This model outlines a series of steps for rapidly sorting through a batch of problems so that those which can be solved quickly, or delegated, or set aside for a later date, are dealt with first.

From a comparison of the general problem-solving model with the actual practice of problem solving, as evidenced by Molson's approach to their packaging problem, it appears that our model and Molson's approach are in close agreement - as far as we are able to compare them. However, from this one example we can not draw firm conclusions as to whether the model is entirely practical or whether Molson's approach is sound. In order to be able to draw valid conclusions we would have to compare the model to several of Molson's decisions. However, from a test of common sense the model appears to be practical and the one example of the packaging problem appears to support this view.
BIBLIOGRAPHY

BOOKS


**PERIODICALS AND ARTICLES**


APPENDIX A

ECONOMIC AND DEMOGRAPHIC DATA FOR BRITISH COLUMBIA AND CANADA

<table>
<thead>
<tr>
<th></th>
<th>BRITISH COLUMBIA</th>
<th>CANADA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unemployment rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>1958</td>
<td>9.4%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>1967</td>
<td>5.1%</td>
</tr>
<tr>
<td>Employment increase</td>
<td>1946-1967</td>
<td>85.4%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>1952-1967</td>
<td>68.5%</td>
</tr>
<tr>
<td>Employment rate</td>
<td>1967</td>
<td>6.6%</td>
</tr>
<tr>
<td>Population increase (total)</td>
<td>1951-1966</td>
<td>3.9% p.a.</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>1961-1966</td>
<td>15.0%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>1951-1966</td>
<td>2.9% p.a.</td>
</tr>
<tr>
<td>Population (adult)</td>
<td>1951</td>
<td>68% of total</td>
</tr>
<tr>
<td>&quot; (adult)</td>
<td>1966</td>
<td>61% of total</td>
</tr>
<tr>
<td>P.D.I. increase (per capita)</td>
<td>1946-1967</td>
<td>171.4%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>1952-1967</td>
<td>73.4%</td>
</tr>
<tr>
<td>P.D.I. (per capita)</td>
<td>1967</td>
<td>$2261</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$2044</td>
</tr>
<tr>
<td>Consumption increase, beer (total)</td>
<td>1952-1965</td>
<td>64.9%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>spirits (total)</td>
<td>72.2%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>wine (total)</td>
<td>394.2%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>beer (per cap.)</td>
<td>10.6%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>spirits (per cap.)</td>
<td>15.6%</td>
</tr>
<tr>
<td>&quot; &quot;</td>
<td>wine (per cap.)</td>
<td>235.5%</td>
</tr>
</tbody>
</table>

Source: Canada Year Books; National Accounts; and Brewing in Canada.
THE SURVEY QUESTIONNAIRE

1. Do you buy bottled beer?
   
   Often       Sometimes       Never
   Terminate

2. Do you have a favorite brand of beer? If yes, what is it?
   Do you know the name of the brewery which makes (favorite)?
   Carling's  Labatt's  Molson's  O'Keefe's  Uncommitted*

3. Do you ask for (favorite) - always, most of the time, or sometimes?
   Always       Most of the Time       Sometimes

4. Can you describe the way in which the box top of (favorite) opens?
   Yes          No          Wrong

5. Show exhibits (if non-zip user)
   Have you seen the other type of box top before now?
   Yes          No          Can't Remember

6. *Show exhibits (if uncommitted)
   Have you seen either of these box tops before now?
   Non-zip      Zip      Both      Can't Remember

7. Let respondent open both
   Which of the two boxes do you find easier to open?
   Non-zip      Zip      No Opinion

Verbatim:  


8. (If answer zip to 7. and is regular zip user)
   Does the type of top have any influence on why you drink Labatt's?
   Yes  No  No Opinion

9. (If regular zip user)
   Do you tear the flaps off after you open the box?
   Always  Sometimes  Never
   If yes, what do you do with them?
   Verbatim: ________________________

10. (If regular non-zip user)
    Do you find it inconvenient to dispose of the top after opening?
    Yes  No  No opinion

11. Would you like to see the other type of box top used by (favorite)?
    (or if uncommitted) Which type of top do you prefer?
    Yes  No  No opinion

12. Is there anything you don't like about the box used by (favorite)?
    (or if uncommitted) Is there anything you don't like about these boxes?
    No  Yes - verbatim: ________________________

13. (If not mentioned in 12)
    Could you comment on the handle and on the flap.
    Verbatim: ________________________
14. Would you recommend any changes to these boxes?

Verbatim: ________________________________

<table>
<thead>
<tr>
<th>Male:</th>
<th>Female:</th>
<th>Occupation:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td>25-under</td>
<td>35-44</td>
</tr>
<tr>
<td></td>
<td>26-34</td>
<td>45-over</td>
</tr>
</tbody>
</table>
APPENDIX C

RESULTS OF SURVEY AND ANALYSIS OF DATA

1. Do you buy bottled beer?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Often</td>
<td>59</td>
</tr>
<tr>
<td>Sometimes</td>
<td>41</td>
</tr>
<tr>
<td>Never</td>
<td>5</td>
</tr>
<tr>
<td>Terminate</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>105</td>
</tr>
</tbody>
</table>

2. Do you have a favorite brand of beer? If yes, what is it? Do you know the name of the brewery which makes (favorite)?

<table>
<thead>
<tr>
<th>Brand</th>
<th>Certain</th>
<th>Uncertain</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old Style</td>
<td>34</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Export Ale</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carling Pilsner</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Label</td>
<td>11</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>Old Country Ale</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toby</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lucky Lager</td>
<td>14</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Labatt's Pilsner</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Labatt's 50</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gold Keg</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old Vienna</td>
<td>8</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

*Certain*, *Uncertain* and *don’t know*, refer to whether the respondent knows which brewery makes his favorite brand. Out of 91, 64 were certain (70%); 4 uncertain (5%); 23 don’t know (25%).
3. Do you ask for (favorite) always, most of the time, or sometimes?

<table>
<thead>
<tr>
<th>Always</th>
<th>Most of the Time</th>
<th>Sometimes</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>52</td>
<td>33</td>
<td>6</td>
<td>91</td>
</tr>
<tr>
<td>Molson's</td>
<td>19</td>
<td>14</td>
<td>35</td>
</tr>
</tbody>
</table>

Out of 91, 52 ask always (57%); 33 most of the time (36%); 6 sometimes (7%).

4. Can you describe the way in which the box top of (favorite) opens?

<table>
<thead>
<tr>
<th>yes</th>
<th>No</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>6</td>
<td>91</td>
</tr>
<tr>
<td>Molson's</td>
<td>33</td>
<td>35</td>
</tr>
</tbody>
</table>

Using the formula:

\[
\frac{x}{n} - 1.96 \sqrt{\frac{p(1-p)}{n}} < p < \frac{x}{n} + 1.96 \sqrt{\frac{p(1-p)}{n}}
\]

where \( p \) is the true proportion, and the degree of confidence is 95%.

\[
\frac{85}{91} - 1.96 \sqrt{\frac{\frac{85}{91}(1-\frac{85}{91})}{n}} < p < \frac{85}{91} + 1.96 \sqrt{\frac{\frac{85}{91}(1-\frac{85}{91})}{n}}
\]

(approximating and substituting \( \frac{x}{n} \) for \( p \) where \( x = 85, n = 91 \))

\[
0.882 < p < 0.984
\]

With a probability of 95%, we estimate that between 88% and 99% of those people who have a favorite brand can describe the way the box top opens.
5. (If non-zip user)

Have you seen the other type of box top before now?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Can't Remember</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molson's</td>
<td>14</td>
<td>21</td>
<td>1</td>
<td>70</td>
</tr>
</tbody>
</table>

n = 70 \ x = 27

\[
\frac{27}{70} - 1.96 \sqrt{\frac{42(1-27/70)}{70}} < p < \frac{27}{70} + 1.96 \sqrt{\frac{42(1-27/70)}{70}}
\]

\[
\quad < 0.271 < p < 0.501
\]

With a probability of 95%, we estimate that between 27% and 51% of those people whose favorite brand uses the non-zip top are aware of the zip top.

6. (If uncommitted)

Have you seen either of these box tops before now?

<table>
<thead>
<tr>
<th></th>
<th>Can't Remember</th>
<th>Non-zip</th>
<th>Zip</th>
<th>Both</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

No trends evident.

7. Which of the two boxes do you find easier to open?

<table>
<thead>
<tr>
<th></th>
<th>Non-zip</th>
<th>Zip</th>
<th>No Opinion</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molson's</td>
<td>4</td>
<td>30</td>
<td>1</td>
<td>35</td>
</tr>
</tbody>
</table>

Verbatim: Zip is good. It is easier, neater, and handier than the non-zip type, but it often breaks at the handle. The non-zip top tends to catch the nails of women. From the results, 90% of those people that buy bottled beer find the zip top easier to open.
8. *(If answer zip to 7, and is regular zip user)*

Does the type of top have any influence on why you drink Labatt's?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>No Opinion</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>20</td>
<td></td>
<td>20</td>
</tr>
</tbody>
</table>

9. *(If zip user)*

Do you tear the flaps off after you open the box?

<table>
<thead>
<tr>
<th>Always</th>
<th>Sometimes</th>
<th>Never</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>17</td>
<td>21</td>
</tr>
</tbody>
</table>

If yes, what do you do with them?

**Verbatim:** Throw them in the garbage or fire.

10. *(If non-zip user)*

Do you find it inconvenient to dispose of the top after opening?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>No Opinion</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molson's</td>
<td>33</td>
<td>35</td>
<td>2</td>
<td>70</td>
</tr>
</tbody>
</table>

\[ n = 70 \quad x = 33 \]

\[
\begin{align*}
\text{With a probability of } & 95\%, \text{ we estimate that between} \\
& 35\% \text{ and } 59\% \text{ of those people whose favorite brand uses} \\
& \text{the non-zip top find it inconvenient to dispose of the top.}
\end{align*}
\]
11. Would you like to see the other type of box top used by (favorite)?

(Or if uncommitted) Which type of top do you prefer?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>No Opinion</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zip Users</td>
<td></td>
<td>20</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>Non-zip Users</td>
<td>54</td>
<td>7</td>
<td>9</td>
<td>70</td>
</tr>
<tr>
<td>Uncommitted</td>
<td>7 (zip)</td>
<td></td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>Molson's</td>
<td>27</td>
<td>5</td>
<td>3</td>
<td>35</td>
</tr>
</tbody>
</table>

\[ n = 100 \quad \chi^2 = 81 \]

\[ \frac{81}{100} - 1.96 \sqrt{\frac{81(1-81)}{100}} < p < \frac{81}{100} + 1.96 \sqrt{\frac{81(1-81)}{100}} \]

\[ 0.732 < p < 0.888 \]

With a probability of 95%, we estimate that between 73% and 89% of the people who buy bottled beer prefer the zip top.

12. Is there anything you don't like about the box used by (favorite)?

(Or if uncommitted) Is there anything you don't like about the boxes?

<table>
<thead>
<tr>
<th></th>
<th>No</th>
<th>No. of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zip users</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Non-zip users</td>
<td>27</td>
<td>70</td>
</tr>
<tr>
<td>Uncommitted</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Molson's</td>
<td>13</td>
<td>35</td>
</tr>
</tbody>
</table>

No. of Respondents 58

Yes: Verbatim: 33-handle too weak; 3-handle too thin and sharp; 9-no dividers; 14 (non-zip users)- top hard to open and doesn't tear well; 2-boxes bulky and can't store in fridge; 2-cardboard thin.
13. (If not yet mentioned)  
Could you comment on the handle and on the flap.

No. of Respondents 64 (100 for flap)  
Verbatim: 46-handle is O.K.; 16-handle too weak;  
2-no comment; 29-flap is O.K.; 28-flap better for fingers; 38-flap makes no difference or is not necessary; 5-flap occasionally catches on bottles.  

\[ n = 100 \quad \bar{x} = 52 \]

\[ 0.52 - 1.96 \sqrt{\frac{0.52(0.48)}{100}} \leq \bar{x} \leq 0.52 + 1.96 \sqrt{\frac{0.52(0.48)}{100}} \]

\[ 0.421 < \bar{x} < 0.618 \]

With a probability of 95%, we estimate that between 42% and 62% of the people who buy bottled beer find the handle unsatisfactory.

\[ n = 100 \quad \bar{x} = 33 \]

\[ 0.33 - 1.96 \sqrt{\frac{0.33(0.67)}{100}} \leq \bar{x} \leq 0.33 + 1.96 \sqrt{\frac{0.33(0.67)}{100}} \]

\[ 0.238 < \bar{x} < 0.421 \]

With a probability of 95%, we estimate that between 23% and 43% of the people who buy bottled beer find nothing wrong with the boxes.

14. Would you recommend any changes to these boxes?

No. of Respondents 100  
Verbatim: (besides changing to the zip top and stronger handles) 57-wanted no changes; 24-wanted dividers; 2-bottles arranged three by four; 2-more compact boxes; 1-stronger boxes; 1-opening at end of box; 1-box made of aluminum.
Male: 93  Female: 7

Age: 25-under: 30  35-44: 26  45-over: 8

Occupations

Electricians,
electrical apprentices 14  Insulator 1
Salesman, sales engineer 12  Factory worker 1
Truck driver 7  Export traffic coordinator 1
Clerk 5  Fireman 1
Mechanic 4  Merchant 1
Contractor 4  Taxi-driver 1
Foreman, supervisor 4  Operating engineer 1
Shipper and receiver 3  Wine maker 1
Welder 2  Glass worker 1
Bank teller 2  Pipe fitter 1
Student 2  Brick layer 1
Surveyor 2  Service technician 1
Estimator 2  Millwright 1
Nurseryman 2  Gas fitter 1
Carpenter 2  Boatman 1
Longshoreman 2  Machine engraver 1
Housewife 2  Machinist 1
Steam fitter 1  Chef 1
Sheet metal worker 1  Seamstress 1
Millworker 1  Secretary 1
Commercial artist 1  X-ray technician 1
Bartender 1  Labourer 1
Warehouse worker 1