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Marketing Research

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Marketing Research

Objectives

- To introduce the basic concepts of research and methodology of conducting researches in marketing domain, and
- To provide a foundation to pursue a professional career in Marketing Research domain.

Unit - I

The Marketing Research System - Definition of MR - Basic and Applied Research – The Marketing Research Process - Types of Research - Steps in Marketing Research Process - Research Design - Data Sources - Marketing Information System – International Market Research.

Unit - II

Sampling Process in Marketing Research– Sampling Design and Procedure – Sampling Methods – Non probabilistic sampling Techniques – Probabilistic sampling Techniques - Sample Size determination - Sampling Errors.

Unit - III

Measurement & Scaling in Marketing Research: Measurement concept – Sources of variation in Measurement, Validity & reliability of Measurement - Attitude measurement – Scaling Procedure

Unit - IV

Data Instruments - Data Collection- Online data collection - Collection of Secondary Data – Collection of Primary Data Methods - Field Operations - Errors and Difficulties in Data Processing, Coding and Editing. Data Analysis - -Hypothesis Testing - Report Writing - Presentation of Data.

Unit - V

Application of Marketing Research: Product Research – Motivation research – Advertising Research – Sales Control Research – Rural Marketing research - Export Marketing research.

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UNIT - I

Unit Structure

Lesson 1.1 - Marketing Research and Decision

Lesson 1.2 - Marketing Research Process

Lesson 1.3 - Research Design

Lesson 1.4 - Marketing Information System

Lesson 1.5 - International Market Research

Lesson 1.1 - Marketing Research and Decision Making

Learning Objectives

- To define marketing research
- To differentiate the types of research
- To explain the support marketing research provides to decision makers
- To discuss application of marketing research in business organizations
- To identify supply sources of marketing research services

Introduction

Research is defined as a “*systematic inquiry aimed at providing information to solve managerial problems.*” The term systematic is related to the scientific method, the idea being that research is the process of inquiry conducted in the best, or at least, most appropriate way.

In this text, we are more specific about a particular domain of research – viz., marketing. We will examine what marketing research is, why and how it is used by marketing managers.

Definition of Marketing Research

Marketing research is defined numerous ways. Let us consider some important definitions to understand the meaning of marketing research.

The American Marketing Association defines marketing research as follows:

Marketing Research is the function which links the consumer, customer, and public to the marketer through information—information used to identify and define marketing opportunities and problems; generate, refine, and evaluate marketing actions; monitor marketing performance; and improve understanding of marketing as a process.

According to Naresh Malhotra , a popular researcher and professor the definition of Marketing research is:

The systematic and objective identification, collection, analysis, and dissemination of information for the purpose of assisting management in decision making related to the identification and solution of problems (and opportunities) in marketing.

Green and Tull, a popular text book authors have defined marketing research as follows:

Marketing research is the systematic and objective search for, and analysis of, information relevant to the identification and solution of any problem in the field of marketing.

These definitions bring out the following common features.

1. Marketing research is a function of a business organization.
2. It links marketer with consumer, customer and public.
3. Information is the outcome of marketing research.
4. It is an objective search- inquiry with a purpose
5. It is systematic. It is based on a defined procedure and uses standard methods.
6. It is a process involving steps like: identification, collection, analysis, and dissemination of information.

7. It is purposeful. It helps managers in improving their understanding of marketing as a process and assists in decision making related to problems and opportunities in marketing. It helps evaluate marketing actions and monitor marketing performance.

Basic and Applied Research

Business research can be classified into two types based on the purpose into pure and applied research.

Basic or Pure Research

It is an inquiry undertaken to expand the limits of knowledge. Pure research is involved with collecting information that might be used by a variety of managers. It strives to answer the broader “what if...” question

Applied Research

It is conducted when a decision must be made about a specific real-life problem. Applied research starts with a problem-solving focus. When a particular management decision is to be made, applied research involves collecting information specific to that manager’s decision.

Applied Research Might Ask

Should we include commission as a part of compensation for XYZ Company sales personnel?

Where Pure Research Would Ask

What type of compensation structure produces aggressive sales approach?
Is commission a motivator?

The findings of basic research contribute to knowledge and can be useful to more than one industry or service category. On the other hand, the findings of applied research are limited in focus and application. They will be useful to one company only. We will now examine the differences in the basic and applied research by taking some more examples. Table presents them.

Issue	Basic research	Applied research
Brain's function in managerial decision making	How does the brain of manager functions during decision making?	How many of our company managers are left brain decision makers? How many are right brain decision makers?
Innovation diffusion	How do consumers respond to innovative products?	What are consumers' attitudes toward a prototype of an innovative home Cleaning kit for use on clothes that require dry cleaning?
Consumer personality and its influence on buying products.	What personality traits explain the purchasing behaviour of mobile phone buyers?	What personality traits explain the purchasing behaviour of Samsung phone buyers?

Both types of research employ the *scientific method*, the analysis and interpretation of empirical evidence (facts from observation or experimentation), to confirm or disprove prior conceptions.

Few authors classified the pure and applied researches as problem identification and problem solving research.

Problem Identification Research

The goal of pure research is to identify the existing or potential problems not apparent on the surface. Examples include research addressed to investigate reasons for decrease in market potential or fall in market share or assessing advertising effectiveness,

Problem Solution Research

The goal is to solve specific marketing problems such as segmentation for skin creams, designing a product for a customer, pricing

for different markets, promotion of industrial goods, and distribution in rural areas. Both basic and applied research is important. They are complementary as one provides knowledge and another provides applications based on the knowledge gained from it.

Marketing Research and Decision Areas

Manufacturers, retailers, suppliers and their competitors need information for designing effective marketing programs that can satisfy customers and earn profits to the enterprises.

Key Inquiry Areas

Information needs of marketing managers pertain to five key areas: target market, product /services, price, distribution, and promotion.

Target market- The interesting questions that marketer will face are:

What is the best target market for the products or services being offered by the organization?

How large is the target market and how can it be described?

What are the attitudes, opinions, preferences, lifestyles, etc., of its members?

Products / services The relevant questions are:

How far consumers in the target market are satisfied with existing products/services?

What product features and benefits do those consumers desire?

How do they compare the company's product with those of competitors?

What sort of features do they need for making them more satisfied?

Price In regard to **price**, the consumer expectations are important to marketer. The relevant questions are:

How much value does the target market place on the product offered by the firm?

Is the firm's product reasonably priced, in the opinion of customers ?

What prices are charged by competitors for similar brands ?

What products are consumers willing to substitute for the product in question?

Has the company brand, features and appeals, that make it a premium brand from consumer point of view?

Distribution - The key questions are:

What distribution channel do the consumers prefer when purchasing the product in question?

Is the organization's product pricing in line with the distribution channel selling it?

Does the pricing include adequate margins for the channel members?

Will the channel be able to provide the service or support needed for the product?

Promotion - The questions of interest are:

What is the positioning and USP of the product?

In which media mix (television, newspaper, billboards, etc.) should the organization advertise?

What should be the budget allocation to specific vehicles of media?

How often should the advertisements appear?

Should personal selling be used and, if so, how?

What kinds of promotions would have a favourable effect on the target market?

Research Provides Answers

Marketing managers in most organizations need answers to some or all of these questions. Obtaining answers to many of these questions requires contact with final consumers. Because most managers are separated from their final consumers—and from the information they need—business and other organizations are increasingly turning to marketing research to obtain the information they need for decision making.

Nature of Information

Marketing research provides the information for decision makers at each step of the marketing decision process. It is the goal of marketing research to provide relevant, accurate, reliable, valid, and current information to management in order to facilitate managerial decisions. The characteristics of the information provided by marketing research are as given under:

- **Relevant-** It is relevant to address the problem or issue being investigated. It is useful being contextual.
- **Accurate-** It is accurate, correct, and precise to provide right understanding of the decision situation
- **Reliable** – Reliable, as it originates from competent, trustworthy sources and can be used with confidence in making decisions.
- **Valid** – It is useful as it is based on right data and right method of investigation and interpretation. It is applicable to the problem at hand. It can be validated by comparing it with other similar researches or by taking the view of experts.
- **Timely** – It is current and timely. It is an up-to-date for decision maker to use it without hesitation.

Marketing Research and Decision Making Process

Marketing research can be used in each stage of the decision making process. We will now see how the decision making is supported by marketing research.

A) Identifying the existence of problems or opportunities

Decision making starts with a problem or an opportunity. A problem is a gap – the difference between standard and actual; a difference between an expectation and the actual.

For instance, a firm expects to sell 1000 units of a product. However, it could sell only 90 units. The gap of 10 units represents a problem. The relevant question is: why consumers did not buy the product?

What is an opportunity? It is a chance to increase benefits. If Government takes a decision to distribute free laptops to students, it is an opportunity to laptop makers, to sell laptops to the government.

Every company has to develop strategies to solve problems and grab opportunities. Before any strategy can be developed, an organization must determine where it wants to go and how it will get there. Marketing research can help managers plan strategies by determining the nature of situations by identifying the existence of problems or opportunities present in the organization.

B) Diagnosis and Assessment

After a problem or a potential opportunity is identified, the decision maker needs information that clarifies the situation. Situation analysis is needed to make strategies. Diagnose the situation – the internal environment and external environment. The internal environment analysis yields information on strengths and weaknesses of a company. The external environment analysis provides an identification of opportunities and threats.

How serious are the problems? How serious are the weaknesses?

How good are the strengths? How good are the opportunities?

Assessment is necessary to find answers to these questions. Managers need to gain insight about the underlying factors causing the situation. If there is a problem they need to specify what happened and why.

What factors are significant in the situation?

What factors caused the deviation from standard or expectation?

What is the magnitude of the loss?

What is the strength of the causal factors?

How can the situation be improved?

Similarly, if an opportunity exists, decision maker has to explore, clarify, and refine the nature of the opportunity.

Marketing research provides diagnostic information with proper assessment of the strengths or weaknesses for decision maker to know the situation.

C) Develop Alternatives and Select a Course of Action

What course of action is to be selected to resolve the problem or gain from an opportunity? Marketing research is often conducted to obtain specific information to help develop various alternatives. By providing the information on performance criteria (expectations, standards or benchmarks) it helps select the right course of action.

For example, a researcher investigating reasons for shortfall in sales, will find the following information.

- Marketing mix of company brand in question.
- Marketing mix of competitors
- Consumer expectations
- Consumer satisfaction with the existing marketing mix.

Based on the information, decision maker can devise alternative courses of action like :

- Reduce price and maintain quality. Increase commission to middlemen. Maintain promotion expenditure.
- Maintain price. Improve quality. Maintain commission to middlemen at the same level. Increase expenditure on promotion.

Thus he can formulate different combinations of the marketing mix. Based on what is more effective in convincing consumers, what is more effective in beating competition, what is more cost effective among them, that course of action is chosen.

D) Implement and Evaluate the Course of Action

Evaluation research is conducted to inform managers whether planned activities were properly executed and whether they accomplished what they were expected to do. Evaluation research can be understood as performance-monitoring research.

For example, a firm decides to launch an ad campaign to increase sales and implements it. It needs the following information to know that all is well with the decision.

Is the campaign conducted as per plans? What is the amount of expenditure incurred on it? What is the frequency of ads placed in different media?

Which media is effective? How is the ad received by target audience? What is the impact on awareness? What is its impact on sales?

If the research indicates things are not going as planned, further research may be required to explain why something “went wrong.”

Whether to Conduct Marketing Research

A manager considering whether or not to conduct research shall consider the following questions. If the answer to any of these questions is “no,” then the researcher / firm should not conduct marketing research activities.

- Availability of data Is the information already on hand adequate for making the decision? If not, can appropriate information be made available?
- Nature of the decision Is the decision of considerable strategic or tactical importance?
- Time constraints Is there sufficient time available before a managerial decision must be made?
- Benefits vs. costs Does the value of the research information exceed the cost of conducting the research?

The typical situation where research is not needed will be a situation that is relatively routine or will be a situation where a decision is needed urgently (where no time is available for research).

Meeting customers, making presentations to prospects, offering discounts to win sales, etc are routine decisions, They are policy based (to offer discount to customers) or procedure based (credit office sends notices to default customers) or rules based(not taking a gift from customers). Such of these decisions do not need research.

Tactical decisions are situation based and reactive. They need some thinking and inquiry but not a formal, elaborate marketing research.

Tactical decisions include decisions taken to counter competition or resolve problems that arise in course of action.

Some of the Examples

- Reducing price when competitor reduces price
- Using a film star as a brand ambassador when competitor uses a sportsman as a brand ambassador.
- Visiting a customer when a problem arises in delivery and customer is angry about it.

Marketing research is not a pressure cooking job. It cannot be done without a proper plan, because it is a formal inquiry based on standard research tools and techniques. It requires time for formulation, organization, data collection and analysis. As such, when time is short, one can use company information system (records and reports) and intelligence (data gathered by simple methods of observation and reading). Marketing research leads to costs. It provides benefits as well. The benefits are information that has value for decision making. It helps make better decisions.

Benefits = Outcome value for decision with information – Outcome value for decision without information

Cost = costs of material + cost of employing people + costs of travel + costs of gifts to respondents+ costs of information processing

Value of marketing research = benefit - costs

Managers should be aware of the implications of research. Managers and researchers should work together to develop the resource requirements and then attempt to evaluate usefulness of findings. They can do so by trying to anticipate the possible findings of the study and then trying to answer the question: “What will I do if these are the findings?”

In response to this question, three situations emerge:

- Do not care for the findings- If it appears that the manager will select a certain course of action regardless of the findings, there is no decision to be made—hence, no need for research to be undertaken.

- Suggested action cannot be taken - It may also be possible that some findings from the research work may suggest courses of action that cannot be undertaken—because of limited financial resources or other constraints like man power requirement / skill set / technological input or expertise. In both the cases, there is no reason to undertake a research project.

Marketing Research Suppliers

For the companies which have decided to conduct marketing research, the immediate question is: “To whom can the job be assigned?” The companies have two options- (i) Internal team of researchers (ii) Professional marketing research agencies. In other words, they have two sources of supply of research- Internal suppliers and external suppliers.

- Internal supplier is the marketing research department located within the firm. Major corporations have their own marketing research departments. They conduct specialised marketing research projects for the company.
- External supplier is not a part of the firm. The external supplier may be a professional marketing and Research firm. There are many such agencies like Anugrah Madison, IMRB, Sampark, and MART.

They offer a wide range of marketing services including problem definition, developing an approach, questionnaire design, sampling, data collection, data analysis, interpretation, and report preparation and presentation.

Marketing Research in the 21st Century

Marketing research, is strongly influenced by two major trends in business: (i) Increased globalization and (ii) Rapid growth of the Internet and other information technologies

Globalization Impact

Many organizations have gone global. The global environment is complex and less known to firms when they make the entry decisions. They may require specific information about markets, competition, consumer preferences and tastes and channel practices.

McDonald has to change the taste of their Pizzas as Indian consumers like spicy foods. If tanning the body is important in USA, whitening is important in India. Accordingly, firms sell cosmetics to the women consumers.

IT Impact

Internet is dramatically changing the face of business research. Information can be gathered in virtual space. Following are the common approaches.

- Getting information from Web sites
- Conducting Web surveys
- Participating in conversations through social media like Facebook and Twitter.

Summary

Marketing research can be defined as a process of systematic inquiry to find information required for managerial decision making. It supports the managers in different phases of decision making and in different areas of marketing. Research can be classified into two types-basic and applied. By method research is two types: exploratory and conclusive. There are suppliers of research data and agencies to help organize research. Consultants like Mckinsey, KPMG and research agencies like Anugrah, Sampark and MART are offering services to marketers. The future of Marketing research is challenging with gloablisation and information technology, changing the scenario of business operations.

Mini-Project

Collect five research papers and examine how the researchers have explained the situation that warranted research.

Lesson 1.2 - Marketing Research Process

Learning Objectives

- To discuss the process involved in marketing research.
- To identify the limitations of marketing research

Introduction

Marketing research has gained significance due to increasing competition, changing consumer preferences and tastes, changes in technology leading to product innovations, and emerging markets in which youth are prime drivers of consumption. As companies have started utilizing the services of research firms, there is a growth in the number of agencies offering a range of solutions from research to strategy formulation. With the increasing number of techniques and tools for data collection and analysis, research has become complex and simple. Complex because firms require investigation of a large number of variables; simple because there is technology that handles complex data.

Marketing Research Process

The research process is to be systematised by dividing it into steps or phases as given under. Such a systematic approach is considered very important, because the entire research project will be conducted within this framework.

- Problem definition
- Statement of objectives, scope and hypotheses
- Research design choices
- Identifying data sources
- Selecting a data collection method
- Sampling respondents
- Data preparation and analysis
- Report preparation and presentation

Types of Research

The process of research is same for different types of research if systematic inquiry is targeted at. The three research types are:

- **Exploratory research**- It helps understand a phenomenon and paves way for deeper inquiry to identify variables and their relationships. It provides preliminary understanding or a feel of the issue.
- **Descriptive research** – It helps describe the phenomena in terms of relationships of variables involved in it.
- **Causal research** - It helps measure variables, the extent of their interrelationships and explains the cause and effect sequence in a phenomenon. Yet another way of identifying research types is based on the data collected.
- **Quantitative research** – The data collected is hard data expressed in terms of numbers like days, metric tonnes, and meters, Example: Time series data of demand which can be examined for growth and variations.
- **Qualitative research** – The data collected is soft data such as perceptions, attitudes, values, satisfaction, expectations etc. Example: Study of consumer attitudes toward different shampoo brands.

Steps in Marketing Research Process

In this section, we will discuss the various steps in marketing research process.

Problem Definition

The researcher should realize that a problem well defined is a problem half solved. Careful attention to problem definition allows the researcher to set the proper research objectives. If little or no planning goes into the problem definition and research objectives, the data that is collected may be of little value.

Defining the marketing research problem to be addressed is the most important step because all other steps will be based on this definition.

To define the research problem, the researcher may choose one or more of the following ways:

- Discussion with the decision maker(s),
- Interviews with industry experts,
- Analysis of secondary data, and
- Some qualitative research

What is the 'problem'? What kind of information is missing for the problem solver to make a decision?

For instance, sales people are not performing well. This is a problem to the organization because it requires good performance. To solve the problem, the organization needs information about the causes.

“What caused the sales people to perform in a poor way?”

The causal factors need investigation. The question the researcher can frame is:

What factors are responsible for the poor performance?

The problem is too broad for investigation. The factors are wide ranging.

- *Relate to manufacturing like* – delay in production causing late delivery to customers, poor quality leading to customer rejections, short supplies making customer disappointed etc.
- *Relate to price* - priced more than the competitors, no discounts,
- *Relate to promotion*- too high promises, limited ads, sales force overloads, poor motivation among sales people, etc.
- *Relate to distribution* - lack of interest among channel members, poor commission to dealers, etc.
- *Competition* – Competitor has strong brands, better marketing program.

At this stage, exploratory research is often used. It helps refine a vague idea of a problem into one that can be researched. Exploratory research progressively narrows the scope of the research. There are four basic exploratory techniques.

They are: (i) secondary data, (ii) pilot studies, (iii) case studies, and (iv) Literature review .

Secondary data is data previously collected and assembled for some project other than the one at hand. It is as such historical data. Secondary data can often be found inside the company, at public libraries and universities, or purchased from a firm specializing in providing information.

In the above case, the records of the company can be consulted to find performance appraisals data, sales data region wise for the past quarters in this year and previous year, and customer profiles in case of industrial products. Based on the data, it can be verified whether it is a seasonal phenomena (happens during the period every year), or because of poor performance of sales people, or because of some major customers leaving the company.

Pilot studies – Pilot study is a small study undertaken prior to launching a large scale study. It may adopt any one of the data collection methods. The data collected from the ultimate subject of the research project serves as a guide for the larger study. Usually the data collection methods used for pilot study are informal. The methods can be observation, focus group interview or panel discussion. The findings obtained from such methods may lack precision. It means they are at best indicative, but not conclusive. They however, can suggest possible topics for formal investigation.

In the above case, a pilot study in one region maybe conducted to have a first feel of the reality. Interviews with sales people, company customers, users of competitor products, examination of promotion efforts, etc will give an idea about the specific problem.

Case studies –A case study is related to a person or company or a place. It is study of a single unit of the total population.

In this case, we may take a branch office as a case study unit and conduct inquiries. Assuming the case applies to the whole unit, problem can be defined for investigation.

Literature review – Latest literature which consists of cases of such companies facing sales decline, or conceptual research papers.

In the present case research papers which developed logic for poor performance can be of help in gaining better outlook for problem solving.

Statement of Objectives, Scope and Hypotheses

Development of a broad specification of how the problem will be addressed allows the researcher to break the problem into salient issues and manageable pieces. This involves the following

- Developing a theoretical framework
- Framing research questions
- Stating objectives
- Designing an analytical model
- Formulation of hypotheses

We will discuss these steps in brief here.

Theoretical framework - Research problem requires a context to define. It can be defined in the knowledge context as a gap to be bridged; something unknown to be known.

The case of poor performance falls in the ambit of performance management in the literature. The theoretical model can be taken and all the variables can be identified and presented for examination in the present context.

Research questions – Research questions indicate what the inquiry is about. The researcher will identify the most relevant variables that have impact on performance and questions their relationship to the phenomena investigated.

In the present case, say researcher has identified poor motivation of sales force as a variable for performance. He raises questions as follows.

What factors determine the motivation of sales force?

What is the level motivation of the sales force?

What is the sales performance of sales force?

What is the impact of motivation on sales performance?

How sales force motivation can be increased?

Objectives - Breaking the research questions into suitable objectives will help researcher in designing the study better. The objectives will help define scope of the study (form a model) and state hypotheses to be tested.

In the case of performance improvement study, the objectives can be

- To study the motivation levels of sales people and their determinants.
- To examine the influence of motivation of sales people on their performance.
- To suggest measures to increase motivation of sales people.

Perhaps the best way to identify specific research objectives is to put them in written form. The manager and the researcher can then discuss the written statement, modifying it where necessary. After it has been approved both by the manager and the researcher, it can serve as the researcher's guide to what the manager expects from the research.

Scope or Model for analysis - Scope defines the area of inquiry. It can be better understood by providing a framework in which the problem is defined and investigated. To provide a visual of the problem, a model can be used. It provides a better and precise understanding.

For research in performance management, the integrated model of performance management may be used to identify the relevant variables under study. By establishing interrelationships among the variables, a model can be developed for investigation.

Hypothesis formulation- Hypotheses are statements of expected outcomes, which a researcher seeks to verify by his or her research. The outcomes are expected in two ways:

1. The managers concerned may have some expectations. The expectations are usually developed by their experience or intelligence (information gathered during their work, through reading, and participation in meetings and conferences). However, they are not sure and want to verify them.
2. The researcher has the literature base, which points out at some probable conclusions. These conclusions are valid for the past situations and for some companies. Their applicability is questionable. However, they can be taken as tentative conclusions to start the research.

In the present case, let us assume that based on his discussion with managers and sales people, the researcher has come to the following tentative conclusions.

- The motivation levels of sales people are low.
- Lack of achievement and recognition are causal factors for low motivation.
- Performance and motivation are strongly correlated.

He can take them as hypotheses and test them for their validity.

Research Design Choices

A research design is a master plan specifying the methods and procedures for collecting and analyzing the needed information. The researcher has to design an approach for data collection based on the sources keeping in mind the time schedule and budget for the research.

The relevant questions for research design are:

What kind of information is needed?

From what sources can it be collected?

What method of inquiry would be appropriate to gather data?

If people are involved, how many persons are to be contacted?

If time duration is important, what should be the period of study?

If people have to provide information, what approach is right to get it?

What kind of procedure is appropriate for data analysis and hypothesis testing?

We will now examine each aspects of design.

Information Requirements Analysis

After a satisfactory statement of the study's purpose and objectives has been established, it is necessary to prepare a list of the information needed to attain the objectives. Because of their busy schedules, some managers may not take the time to identify the information they need for decision making.

They may think their request is obvious and routine, and that the researchers "will understand and know what to do." Whatever the cause, there are occasions when managers do not become adequately involved in giving direction to the research and allow the responsibility for the identification of needed information to pass into the hands of the researchers.

In the case considered by us, the information requirements include:

How many sales people are working?

What is their track record of performance? What is their current performance?

What are their attitudes towards work and company? What factors are motivating them? What are the performance dampening factors?

What are their experience, education, age and gender details?

Design Choices

Two types of research designs can be considered by researchers- exploratory and conclusive. Exploratory studies are used for finding out and defining a problem for research. It forms the basis for future research. Conclusive research on the other hand, provides solid answers to the questions, with strong evidence to draw conclusions and make policy decisions.

Conclusive research may take different routes for study of the phenomenon. It can be (i) descriptive research or causal research. Descriptive research can be a single unit case study or study of a group of units. Causal study focuses on cause –effect relationships of variables under the study. Descriptive study also analyses relationships among variables and describes the outcomes of their interactions. However, causal study adopts a more rigorous, analytical approach than descriptive study and focuses on limited variables for improving precision in results. Exploratory studies make use of surveys and observation techniques, whereas casual research conducts experiments. A brief description of these methods is given under.

Surveys

The most common method of generating primary data. It is a technique in which information is gathered from a sample of people by use of a questionnaire. Questionnaires can be administered by mail, phone, or person-to-person. Each administration method has its advantages and disadvantages, and all are appropriate in different situations.

Observation Techniques

The objective of research is often merely to record what can be observed. The advantage of it is that it is nonreactive and the data can be unobtrusively and passively collected without a respondent's direct participation. For the inexperienced researcher it can be difficult to administer and its biggest disadvantage is that it cannot observe intangible states of mind.

Experiments

The method is useful for establishing cause-and-effect relationships. Experiments allow investigation of changes in one variable while manipulating one or two other variables under controlled conditions. Causal factors can be isolated because outside factors do not come into play.

One example of experimentation is test marketing. Marketers introduce a new product in a city, in which consumers represent by and large

the target market of the product. If the product succeeds to sell there, it is launched nation-wide. Otherwise, reasons for failure are analyzed and steps are initiated to offer a better product.

Which design one has to choose? Should the research be exploratory or conclusive?

The tradeoff factors like cost, urgency, availability of data help evaluate the designs. To a great extent, this issue is likely to be determined by the research objectives and the situation leading to the request for research.

- Exploratory research is likely to be used when investigating a potential opportunity or problem
- Conclusive research is likely to be used when the research findings are expected to result in specific decisions being made or specific actions being taken.

Although there can be numerous exceptions to this generalization, the determination of whether to do exploratory research or conclusive research will be strongly guided by the objectives of the research.

In fact, there is no one best research design; selecting the most appropriate research design depends on factors like (i) time available (ii) cost (iii) precision required in research.

Identifying Data sources

There are two basic research approaches - Primary data research and Secondary data research.

Primary data is requires asking. Since asking has to be systematic to make data collection from managers. Trade persons, sales people, customers, etc., researcher has to develop some sort of information check list or questionnaire to gather data. Typically secondary data research involves using past data to project future figures for a particular event or phenomena. This technique uses greater quantitative sophistication than is employed at the exploratory level of research.

The marketing researcher should determine whether required information is already available, either in company records or in outside sources or any other prior research works. As a wise decision, the researcher should not collect data from the field until the appropriate secondary sources of information have been reviewed. On occasions, it may be sufficient to derive conclusions based on available information from various other sources. If the needed information is not available from secondary sources, the researcher will have to collect data in the field, and so it will be necessary to design a data-collection project.

Selecting a Data Collection Method

Data collection involves three decisions-

- *Instrument* - Methods including questionnaire, panel discussion, interviews etc.
- *Subjects*- The choice is between the population and sample of people who have to provide data.
- *Contact approach* - How the data is to be collected using the chosen method of inquiry? Whether it is to be done through face to face approach or through telephone or web tools.

Data Collection Instruments

The process of collecting information from respondents requires a method. For example, the survey method requires direct participation, and use of checklists, questionnaires, interview schedules, panel discussions etc., while an unobtrusive method of collecting data may use observation methods.

Sampling

Another critical decision is the design of sampling; sampling involves any procedure that uses a small number of items, or that uses part of the population to make a conclusion regarding the whole population. A sample is a subset from a larger population. There are two basic types of samples:

- Probability sample: In this method, every member of the population has equal selection chances.
- Non-probability sample: The sample is selected on the basis of convenience or personal judgment. The chances are biased and not free from human intervention.

Contact Approaches

Data collection involves the use of some kind of field force where the field force could operate either in the field, as in the case of personal interviewing, or from an office, as in the case of phone or mail surveys. A field force (personal interviewing, phone, mail, or electronic surveys) gathers project data. Field workers must be trained and monitored properly to obtain data properly.

Data Preparation and Analysis

The researcher should understand that the purpose of data analysis is to derive meaning from the data which has been collected. For that, data must be converted, through editing and coding, into a format that will answer the marketing manager's questions.

- Editing – It involves checking the data forms for omissions, legibility, and consistency in classification.
- Coding - Before the edited data can be tabulated, meaningful categories must be established for groups of responses - this process is called coding and it facilitates computer or hand tabulation.
- Analysis-It is the application of logic to the understanding of data that has been gathered; it varies from the simple determination of patterns to complex statistical analysis. Researchers use bi-variate or multi-variate analysis techniques, depending upon the requirement. With the availability of computer softwares, even complex data processing has become easy and simple.

Report Preparation and Presentation

The report should address the specific research questions identified in the problem definition, describe the approach, the research design,

data collection, and the data analysis procedures adopted, and present the results and the major findings. The findings are communicated to the client.

This stage involves preparing the information and making conclusions which will be useful for decision-making purposes. The research report should effectively communicate the research findings. If a research report is too long, complex, etc., for managers to use, then it is totally useless.

Limitations in Research

Marketing research process consists of steps which are interdependent. Each step depends to some extent on the other. The first step must be planned with the second, third, and remaining steps in mind.

For example, the marketing researcher must have a good understanding of the research objectives in order to identify the information needed to achieve the research objectives. The form and content of the “required /needed information” will strongly affect the questionnaire or any instrument to be used for data collection; this sequence, in turn will affect the collected data and result in findings, which may be of poor quality. If not properly designed, each step in the research process can be a potential source of error.

An error in step, would mar the entire process and gives wrong findings. As such care is to be taken to make each step effective.

Possible Errors

One source of research error is a poorly conceived study. Much of the responsibility for specifying research objectives necessarily lies with the manager. However, researchers would do well by offering a solution that can resolve the problem as well as fit in the decision frame of manager. Every manager has some kind of model—either explicit or implicit—of the world within which he/ she operates. If the researcher does not have a good understanding of how his manager sees the real world, any research project he designs is likely to gather some information that is not useful to the manager. Quite possibly, there will be some information that the manager needs but that the research project will not gather.

In order to avoid such errors, the researcher and the manager must work together to identify the decision model that the manager will use in making a decision. For example, after discussion with her researcher, a manager may state the decision model as follows:

If research findings show X, my decision will be A; if research findings show Y, my decision will be B; if research findings show Z, my decision will be C; and so on.

If a manager can specify the decision model to be used, that model can be used to design a research project that will provide the information needed for the decision.

Although the marketing researchers have little chance of identifying such a decision model without the manager's cooperation and participation, they can contribute substantially to its formulation. The research objectives will become more precisely defined, and this will enhance the utility of the research.

Researchers encounter many possible sources of error when designing a data-collection stage of the research project. Some of these include:

Using a poor or inappropriate research design (not using experimental designs where possible); Using poor experimental designs; and still others.

If the study is a conclusive one, and if the findings are to be "representative" of the universe, the researcher may want to use a large-scale statistical study. However, if the project is concerned with finding a "best" way rather than a typical way of doing something—such as laying out the main floor of a fast-food restaurant, then the research may well consist of the analysis of a few selected cases.

The cases may be selected on the basis of the researcher's judgment as to what are the most successful cases available and, possibly, the least successful for comparison. Only a few cases would be chosen—may be only three or four. For example, in a test of advertising copy, respondents could first be interviewed to measure their awareness of, and attitudes toward, certain brands. Then they could be shown pilot versions of the proposed

advertising copy. Following that, their attitudes could be measured once again to see if the proposed copy had had any effect.

Sampling Errors

Not selecting the type of respondent who has valid and reliable information is a major error. The researcher must identify who has the needed information and how it can be obtained.

For example, in a study which seeks to find out if children influence the brand(s) of ready-to-eat cereal purchased by their parents, the researcher must decide if only adults are to be studied, or children are also to be included. The researcher must decide if data are to be collected through observing purchase behaviour in supermarkets or through interviewing, whether the interview is to be a personal one in stores near the cereal display or a telephone interview to the home where the cereal is consumed.

Summary

Marketing research is a process and it can be performed effectively if one follows the steps in conducting it. The process begins with problem definition. It is followed by establishment of objectives, scope and hypotheses which provide direction to a researcher to move forward. Next, he needs an organized approach to move on to the destination of knowledge. This is provided by research design, data sources identification, data collection and data analysis. In the final stage, a report is prepared and presented to the firms for resolving the problem, for which research is conducted.

Lesson 1.3 - Research Design

Learning Objectives

- To elaborate various research designs available for marketing research.
- To discuss the consequences of poor research designs

Introduction

The purpose of research is making an inquiry about a phenomenon for finding a solution to the problem or identifying a way of utilizing an opportunity. To achieve the end of collecting right information from right source, in the right way and analyze it in the right manner researcher has to make analysis of the alternatives available at each step of the research process. In this lesson, we will discuss the design choices, available to researchers.

Concept and Types of Research Design

The research design is a framework or blueprint for conducting the marketing research project. It specifies the precise details of the procedures necessary for obtaining the required information. It is important to have a good research design in order to ensure that the marketing research project is conducted effectively and efficiently.

We broadly classify the research design into two types:

1. Exploratory
2. Conclusive- Descriptive and Experimental

Exploratory

Exploration refers to finding something existing but unknown to us. It is getting information and getting an idea about the issue. However, the information is not valid for making major decisions.

Conclusive- Descriptive and Experimental

Conclusion refers to an understanding obtained from discussion. It is based on evaluation of the situation.. The information obtained for conclusion covers all aspects of inquiry. It is reasonable in depth and good in terms of validity and reliability.

Exploratory research is used in situations where the issue is not clear. It helps gain additional insights about the issue (clarifies the problem) and formulate hypotheses (tentative solutions to the problem on hand).

Conclusive research would be used to test specific hypotheses, examine specific relationships, or make predictions; this will include both descriptive and causal research designs.

- Descriptive research is used to describe something, usually market characteristics or functions.
- Causal research is used to obtain evidence regarding cause-and-effect relationships.

We will now discuss the purposes and methods of each of the three research designs in detail.

Exploratory Research Design

The aim of exploratory research design is to get a better understanding or insights of the research problem. Exploratory research helps ensure that a rigorous and conclusive study will not begin with an inadequate understanding of the nature of the business problem.

Drivers Exploratory research is undertaken in the following situations.

1. *Limited knowledge*- There are limited amount of research works discussing the issue and hence prior knowledge about these studies are limited. The researchers need insights to develop further research works.

2. *Prior to a major research* - When a major research is planned to for making policy decisions, a pilot study in the form of exploratory research is undertaken.

The characteristics of the exploratory design are:

1. Single vs serial research - Exploratory research may be a single research investigation or it may be a series of informal studies; both methods provide background information.
2. Informal approach - Researchers must be creative in the choice of information sources. They should explore all appropriate inexpensive sources before embarking on expensive research of their own. However, they should still be systematic and careful at all times.
3. Nature of data - Most exploratory research designs provide qualitative data which provides greater understanding of a concept. In contrast, quantitative data provides precise measurement.

Purposes

There are three different purposes for conducting exploratory research; all three are interrelated:

- A. ***Discovering new ideas*** Uncovering consumer needs is a great potential source of ideas. Exploratory research is often used to generate new product ideas, ideas for advertising copy, etc.
- B. ***Concept testing*** Concept testing refers to those research procedures that test some sort of stimulus as a proxy for a new, revised, or remarketed product or service. Generally, consumers are presented with an idea and asked if they like it would use it, etc. Concept testing is a means of evaluating ideas by providing a feel for the merits of the idea prior to the commitment of any research and development, marketing, etc. Concept testing portrays the functions, uses, and possible situations for the proposed product
- C. ***Diagnosing a situation*** Exploratory research helps diagnose the dimensions of problems so that successive research projects will be on target. Particularly, when the topic of research is very new,

the researcher needs insights to develop research problem and magnitude of the issue and variables involved in the research.

- D. **Screening alternatives** When several opportunities arise and budgets restrict the use of all possible options, exploratory research may be utilized to determine the best alternatives. Certain evaluative information can be obtained through exploratory research.

Design Categories

A manager may choose from three general categories of exploratory research:

A. Experience Surveys

Concepts may be discussed with people who have had personal experience in the field being researched. This constitutes an informal experience survey.

Who should conduct?

Such a study, aimed at experience sharing, if conducted by the business manager rather than the research department, shall be more useful for narrowing down the research domain.

Who may be the respondents?

Senior executives or managers inside the firm and consultants or experienced people who have been carefully selected from outside the organization form the population for the study.

How do you collect data?

An experience survey may be a small number of interviews.

B. Secondary Data Analysis

A quick, easy and economical source of background information is trade literature. Research rarely begins without a literature review. In this method key considerations are:

- *Relevance* –The research works or conceptual papers or data chosen for study should be relevant to the issue. The unnecessary one are to be carefully avoided.
- *Sufficient* – Another important point is whether the studies or data are adequate to provide an answer to the problem on hand. In many a case, data gaps may exist. Sometimes only outdated data or scholarly works will be available. When relevant and sufficient research or data is not available, researchers has to supplement this method with primary data based inquiry.

C. *Case Study Method*

The purpose of a case study is to obtain information from one, or a few, situations similar to the researcher's situation. A case study has no set procedures. However, this freedom to research makes the success of the case study highly dependent on the ability of the researcher.

To be useful, the inquiry should cover all the relevant areas of the person or organization under study. One should get clarity in the inquiry by asking questions like What? Which? Why? Where ? How? Who ? When ?

For instance, you are inquiring a case of purchase of a refrigerator; the relevant questions helpful to researcher may be as given under.

What is the reason for the purchase? Which brand did you buy?

Why did you buy that brand? Where did you buy it?

How did you know about it and how did you buy (down payment or a scheme of installments)?

Who influenced who decided and who purchased? When did you buy- during off season or normal times?

In inquiry of this kind, the cooperation of the party whose history is being studied is very important.

D. Pilot Studies

The term “pilot studies” is used as a collective to group together a number of diverse research techniques all of which are conducted on a small scale. They generate primary data from consumers, or other subjects of ultimate concern. There are three major categories of pilot studies:

- *Focus group interviews:* These are interviews with a small group of people. They have a flexible format. It means they can discuss anything from brand to a product itself. They are free-flowing – participants can talk freely to express their view points.
- *Projective techniques:* Individuals may not give true answers in many cases. This is more so in case of sensitive issues like cigarette smoking, alcohol drinking etc. They may give a true answer if the question is disguised. If respondents are presented with unstructured and ambiguous stimuli and are allowed considerable freedom to respond, they are more likely to express their true feelings.

Instead of asking directly about the smoking habits of an individual ask him about his views on smoking, his friends who smoke, and his knowledge about diseases caused by smoking.

- *Depth interviews:* Depth interviews are similar to the interviews of a clinical psychiatrist. They are more penetrative and dig the history of the patient. In this case, they seek to know more about the respondent in detail.

CASE : Mobile Seller in Dilemma

A mobile phone operator introduced a new scheme for its user – using internet from their mobile using GPRS Services – at a nominal price. Initially the sales were very high and exceeded the expectations of the company. The company felt happy and decided to go in a big way. However, they had a sudden jolt.

The initial wave of high sales subsided. The sales began to slow down.

Three other service providers had entered the market by this time. The company did not know, why the sales declined. They were confronted

with a spate of questions.

1. Whether the whole industry had slowed down?
2. Whether the product has become weak compared to those of competitors?
3. Was it a temporary setback, in that perhaps the market comprised of “early adopters” had been saturated?
4. If early adopters are saturated, how much time other users need to begin to buy when they saw how well the other users are benefited?
5. Was it because customers are waiting for newer technological products / services [like 3G, WLL] that might be introduced in the market
6. Were distributors less interested in promoting the product aggressively?
7. Are customers experiencing difficulties in getting connections due to high traffic ?.

Questions

Which of the problems listed above might have arrested the growth of sales?

Do you need any preliminary research to identify the real problem?

If yes,

what do you do? If no, why?

Dispensing with exploratory research

May I proceed to a major, conclusive research without undertaking exploratory research?

The answer is a hesitant yes, when you have sufficient experience or knowledge. If the research budget is limited, many marketers think that exploratory research can be dispensed with.

However, it is better to think before dispensing with it. Projects are always subject to a budget and a complete study may be infeasible. However, a prudent consideration of those areas which must be cut should be identified. Analyze each aspect in terms of the tradeoffs.

Sufficient knowledge gained from a high level of experience with similar problems may allow the researcher to dispense with exploratory research under a tight budget. However, the tradeoffs is that some salient factors may not be considered; thus, the results may be seriously biased.

Descriptive Research Design

Descriptive research is conducted to discover and determine the characteristics of a population. It seeks to determine the answers to the questions “who,” “what,” “when,” “where,” and “how.” However, it does not tell us “why” or the causes for an effect.

It is characterized by a clear statement of the problem, specific hypotheses, and detailed information needs. In this type of research design, the researcher begins with the structure (a model) already defined and proceeds to actual data collection in order to describe a process or determine some market variable..

For example,

- Explain how a consumer comes to know about a product and makes a purchase decision (purchase process model)
- Discuss how consumers respond to innovations (Innovation diffusion model)
- Determining the average age of purchasers of your product
- Average time spend in a shopping trip
- Buyer’s consideration set size for their branded washing powder

The evidence the research provided will be used to determine a course of action. As such, it should be conducted as accurately as possible. It is impossible to completely eliminate error.

Examples of descriptive studies are

1. Market studies, which describe the size of the market, buying power of the consumers, availability of distributors, and consumer profiles.
2. Market share studies that determine the proportion of total sales received by a company and its competitors.
3. Sales analysis studies that describe sales by geographic region, product line, type, and size of the account.
4. Image studies which determine consumer perceptions of the firm and its products.
5. Product usage studies that describe consumption patterns.
6. Distribution studies which determine traffic flow patterns, and the number and location of distributors.
7. Pricing studies which describe the range and frequency of price changes and probable consumer response to proposed price changes.
8. Advertising studies that describe media consumption habits and audience profiles for specific television programs and magazines.

An interesting introduction to this topic is noting that the six W's are used by journalists when trying to gather facts for a story. In like manner, because descriptive research is marked by the prior formulation of specific hypotheses, the design requires a clear specification of the six W's of the research:

1. Who: Who should be considered?
2. Where: Where should the respondents be contacted to obtain the required information?
3. When: When should the information be obtained from the respondents?
4. What: What information should be obtained from the respondents?
5. Why: Why are we obtaining information from the respondents?
6. Way: The way in which we are going to obtain information from the respondents.

These questions form the basis for describing the research to be conducted.

a) Who—who should be considered a consumer of mixed chocolate pineapple cookies? Some possibilities are:

- Anyone who buys cookies
- Anyone who buys premium priced cookies
- Anyone who buys chocolate cookies
- Anyone who has bought Sweet Brand cookies

b) Where—where should the respondents be contacted to obtain the required information? Some possibilities are:

- In the grocery store
- At home
- In the parking lot

c) When—when should the information be obtained from the respondents? Some possibilities are:

- Before purchasing their groceries
- While purchasing their groceries
- Immediately after purchasing their groceries
- Within two weeks of purchasing their groceries

d) What—what information should be obtained from the respondents? Some possibilities are:

- Demographics
- Psychographics and lifestyles
- Attitude toward the chocolate pineapple cookies
- Attitude toward the premium price

e) Why—why are we obtaining information from the respondents? Some possibilities are:

- To determine consumer attitudinal reaction to the new cookie

- To determine the market size

f) Way—the possible ways in which we are going to obtain information from the respondents. Some possibilities are:

- Observational techniques
- Scanner data
- Personal interview
- Telephone interview
- Mail interview

Causal Research Design

Causal research design deals with answering questions like “why”. It attempts to identify cause-and-effect relationships between variables. It usually follows exploratory and descriptive research and, therefore, the researchers are quite knowledgeable about the subject.

For instance, sales of a firm has gone up. The causal factors may be – product effectiveness, ad effectiveness, consumer preferences, competitor weak points, etc. Exploratory research provides a rough estimate of the major reason. Let us say, it is identified as ad effectiveness.

Descriptive research describes the relationship between ad elements and consumer attitudes or preferences to the product. It explains the correlation among the ad variables and consumer preferences.

Causal research, precisely estimates the extent to which each variable of ad has contributed to the rise in sales.

Thus, causal research attempts to establish that when we do one thing (e.g., increase advertising), another will follow (e.g., increased sales). In other words every action causes some effect. It seeks to obtain evidence regarding cause-and-effect relationships. It proceeds from a pre-established structure and attempts to infer causal relationships between variables. Examples of the studies which fall under causal research category are:

1. Effect of increased advertising spending on increase in sales
2. Effect of promotional offers for washing powder products – the consideration set size
3. Effect of a parallel ad campaign about the shopping centre on average time spent in a shopping trip of its customers

Causal vs Descriptive Research

The differences between exploratory and conclusive research can be distinguished by their objectives, characteristics, findings from the research, and outcomes of the research.

Objectives - First, the objective of exploratory research is to identify relationships and formulate hypotheses, whereas the objective of conclusive research is to examine relationships and test hypotheses.

Methodology- Second, in exploratory research the information needed is only loosely defined. The research process that is adopted is flexible and unstructured. The sample, selected to generate maximum insights, is small and non-representative.

The primary data, which is collected, is qualitative in nature and is analyzed as such. In conclusive research, the information needed is clearly specified. Such research is typically more formal and structured than exploratory research. It is based on large and representative samples and the data obtained are subjected to quantitative analysis.

Findings- Third, given these characteristics of the research process, the findings of exploratory research should be regarded as tentative or used as input to further research, whereas the findings from conclusive research are considered to be final and useful for policy making.

Design Considerations

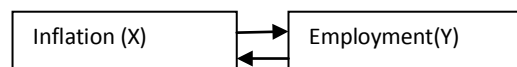
Developing a causal research designs is indeed a tough task.

- First, you have to be able to understand the phenomenon.
- Second, you have to separate variables – dependent and independent ones.
- Third, identify the cause factors and effect factor(s).

Of course the researcher often believed that cause has to happen before the effect. Did you ever hear of an effect happening before its cause? Before we get lost in the logic here, consider a classic example from economics:

Does inflation cause unemployment?

It certainly seems plausible that as inflation increases, manufacturing costs will rise. More employers find that in order to meet costs they have to lay off employees. So it seems that inflation could, at least partially, be a cause for unemployment.



With less demand and less production needs, some firms will go out of market. Government takes steps to reduce inflation. As situation improves, demand will increase for products. Firms increase work force (employment) to produce more and meet rise in demand for goods. This would tend to drive up the prices (inflation).

So which is the cause and which is the effect, inflation or employment? It turns out that in this kind of cyclical situation involving ongoing processes that interact that both may cause and, in turn, be affected by the other. This makes it very hard to establish a causal relationship in this situation.

Experimental Design

The causal research requires examination of the effect with reference to a cause. It seeks to answer the question- If there is n degrees of change in X, how many degrees of change has taken place in Y? Causal

research can be conducted either in a laboratory or in a field setting. However, the situation should be such that there are only two variables –dependent and independent – for observation and measurement. We can define experiment as follows.

“An experiment involves the creation of a contrived situation in order that the researcher can manipulate one or more variables whilst controlling all of the others and measuring the resultant effects”.

Boyd and Westfall have defined experimentation as:

“...that research process in which one or more variables are manipulated under conditions which permit the collection of data which show the effects, if any, in unconfused fashion.”

As noted above, experiments can be conducted either in the field or in a laboratory setting. When operating within a laboratory environment, the researcher has direct control over most, if not all, of the variables that could impact upon the outcome of the experiment. However, not all experiments can be conducted in a laboratory setting.

We will now consider two cases to make the point clear.

In-Store Sales Experiment

When United Fruits were considering replacing their Gros Michel variety of banana with the Valery variety, a simple experiment was first carried out. In selected retail outlets, the two varieties were switched on different days of the week and sales data examined to determine what effect the variety had on sales volumes. That is, the variety was being manipulated whilst all other variables were held constant. United Fruits found that the switch back and forth between Gros Michel and Valery had no effect upon sales. United Fruit were therefore able to replace Gros Michel with Valery.

Laboratory Taste Tests

An agricultural research station wanted to compare the acceptability of a new variety of maize. Since the taste is likely to have a major influence

on the level of acceptance, a blind taste panel was set up. The respondent volunteers were given small portions of two porridge samples in unmarked bowls. They were asked to distinguish between the maize varieties and identify the one which they preferred.

Summary

Research design is a framework or blueprint for conducting marketing research projects. The popular designs are: explorative, descriptive, and conclusive. Explorative research makes use of (i) pilot studies (ii) secondary data (iii) focus group interviews and (iv) case studies. Descriptive research can be done by observation and survey techniques. Causal research is usually done in laboratory and field settings.

Mini-Project

Collect five research papers and develop a comparative analysis of – problem, objectives, sampling, data collection and data analysis.

Lesson 1.4 - Marketing Information System

Learning Objectives

- To explain data sources for marketing manager
- To describe the concept and significance of MIS
- To elaborate the role of DSS in decision making of managers

Introduction

Today managers are aware that they need different kinds of information at regular intervals of time in order to deal with recurring and non recurring decisions. As a consequence, they have found it very helpful to use a variety of data sources besides several regularly scheduled research projects that support or complement one another in providing managers with the appropriate information needed.

Data Sources

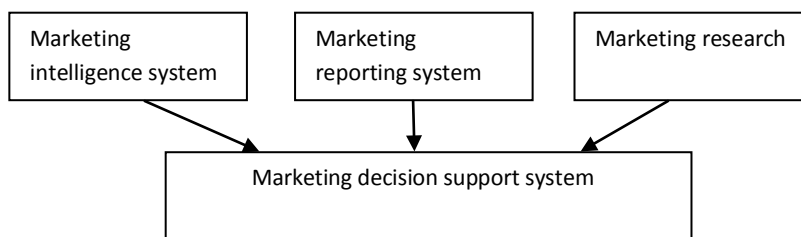
Every business organization is found to have the twin objectives - perpetuity and profitability. Perpetuity refers to the long life of the organization. If a firm has to survive for a longer period of time, it has to make decisions in a consistent and progressive manner and maintain its strategic advantage.

They have to make two types of decisions- operative (recurring) and strategic (non-recurring) in an appropriate manner. Decisions can be made effectively only when right information is available at right time in an appropriate form. To get such information, managers have to first identify the sources and make use of them.

The information sources are divided into two types: (i) primary data sources which managers collect for their use and (ii) secondary data sources which someone has already collected and even analyzed for his or general use.

Managers own sources of data can be classified into three types:

1. Intelligence data- Data collected through reading news papers and magazines and participation in seminars and conferences.
2. Reporting data- The reports that manager gets in regular intervals and used for monitoring activities of subordinates or understanding the progress made.
3. Research data – Data obtained by conducting research on a small or large scale by a company team or an outside agency. It might have used secondary data or primary data sources or both.



Marketing Information System

When a company begins to regularly schedule the coordination of information and data, flowing in from diverse sources, the company has begun to develop a marketing information system (MIS). The growth of MIS from local to global level indicates the importance it has gained in recent years.

The well being of multinational corporations, indeed the health of any business organization planning to prosper in the 21st century, depends on information about the world economy and global competition. Contemporary marketers find that much information can be made instantaneously available. This has changed the way business is conducted. In particular, an emerging concept is Global Information System (GIS); it is an organized collection of computer hardware, software, data, and personnel designed to capture, store, update, manipulate, analyze, and immediately display information about worldwide business activity.

Decision Support Systems

A decision support system is a computer-based system that helps decision-makers confront problems through direct interaction with

databases and analytical models. The purpose of a decision support system is to store data and transform them into organized information that is easily accessible to marketing managers.

Database is a collection of information that is arranged in a logical manner and organized in a form that can be stored and processed by a computer. A mailing list of customer names is one type of database. Population characteristics recorded by state, county, and city may be contained in another database. Databases often exist in computer storage devices such as hard disk drives. But, other types of databases may exist in a vendor company's computers.

Analytical models are the statistical analysis methods like descriptive statistics like averages and deviations, relationship testing methods like correlation and regression and hypothesis testing measures like t-test, z test, chi-square test, F-test and so on. In addition it may include mathematical models like linear programming, waiting line models etc.

Decision support systems serve specific business units within a company. Take the case of CRM.

Most major corporations have decision support systems to provide Customer Relationship Management (CRM). A CRM system might bring together lots of pieces of information about customers, sales, marketing effectiveness, and responsiveness and market trends. The goal of the CRM decision support system is to help managers make decisions such as the ones given under:

Data base	Decision
Customer relationships in sufficient detail	How to maintain and improve relationships?
Customer needs and expectations	How to change design of service or product?
Customer purchases	What else can be offered to increase purchases?
Customer service requirements	What services can be added or improved further?

The concept of a data warehouse is a term that managers of information technology use to discuss the multi-tiered, computer storage of current and historical data and the mechanics of selecting and using information, which is relevant to decision-making tasks. Data warehouse management requires that the detailed data from operational systems be extracted and transformation so that layers of summarized data “tables” can be stored (warehoused) so the various data bases are consistent. Organizations with data warehouse may integrate databases from both inside and outside the company.

A decision support system’s business intelligence software allows managers to combine and restructure databases, diagnose relationships, discover patterns, estimate variables, and otherwise analyze the various databases.

Decision analysts apply complex statistical procedures and computerized decision models to such data.

Inputs for a Decision Support System

The firm can generate data in different forms- all numeric, text, voice, and image data and get it from two formal sources:

Reports and records

Internal databases containing records, such as accounting reports of sales and inventory figures, provide considerable data that may become useful information for managers. An effective data collection system establishes orderly procedures to ensure that data about costs, shipments, inventory, sales, and other aspects of regular operations are routinely collected and entered into the computer.

Research

Proprietary business research, such as survey findings, emphasizes the company’s gathering of new data. Few proprietary business research procedures and methods are conducted regularly or continuously. Instead, research projects conducted to study specific company problems generate data; this is proprietary business research.

Outside vendors and external distributors market information as their products. Many organizations specialize in the collection and publication of high-quality information.

Statistical and financial databases may be sources of input. One outside vendor, the A. C. Nielsen Company, provides television program ratings, audience counts, and information about the demographic composition of television viewer groups. Because most companies compile and store many different databases, they often develop data warehousing systems.

MIS and Marketing Decisions

So far we have discussed how marketing information can be developed to help managers take marketing decisions. Now we discuss the case of Gillette- a shaving products company.

To help its managers develop their marketing plans, a popular men's shaving product company gathers from five different types of regularly recurring research projects. The five projects were designed to provide the managers a complete picture of the razor and blade market, including detailed descriptions of consumers, competition, and distribution.

- Each year a large number of people are selected in a nationwide sample and are personally interviewed in their own homes. The purpose is to determine the brands of razors and blades used by consumers, and to measure consumers' attitudes toward both Gillette's products and competitors' products.
- The company uses a large panel of shavers who are studied annually through the use of mail questionnaires. These projects are able to measure brand loyalty and brand switching because the same individuals are studied year after year.
- Annual telephone surveys provide the company with brand awareness and advertising awareness information. These surveys tell the company how it compares with competition on these two important awareness measures.
- Each month the company conducts two or more consumer use

tests, involving both all competitive brands, in order to evaluate the strengths of all brands. The tests ensure that the company's products are up to standard and that no claims are made that cannot be substantiated.

- Inventory audits are taken regularly at both the retail and wholesale levels. These provide the company with information regarding product inventory and display, pricing, out-of-stock, local advertising, and more.

These five projects provide the firm's marketing managers with information on market shares, brand loyalty and brand switching, consumer attitudes, brand and advertising awareness, product advantages versus competition, inventory levels, out-of-stock, retail prices and display, local advertising, and more.

As the data are gathered from recurring studies, the managers have a complete picture of current market and competitive conditions from the most recent set of studies, and they know the recent trends that exist in all of these data. All of these items of information provide the managers an excellent historical record on which to base the development of their new marketing plans.

Summary

Information obtained from marketing research and other sources such as internal record keeping and marketing intelligence becomes an integral part of the firm's marketing information system (MIS). DSS and MIS provide data based and analytical models for the benefit of managers in making marketing decisions.

Mini-Project

Identify two management problems and list the information necessary to solve the problems.

Lesson 1.5 - International Market Research

Learning Objectives

- To bring out the importance of International Marketing Research
- To discuss various factors influencing International Marketing Research projects

Introduction

Globalisation and Information technology have paved for expansion of international markets for many firms. Firms could sell, not only through physical but also through e-distribution channels. As such today large firms have two types of customers – those who buy at malls, chain retail outlets, and authorised dealer shops as well as through internet.

Globally marketing research has picked up. It is estimated that about 40 percent of all marketing research is conducted in Western Europe and an additional 9 percent is conducted in Japan. Only 39 percent of worldwide marketing research expenditures are spent in the United States. Thus, International marketing research is expected to grow at a faster rate than domestic research.

Peculiarities of International Marketing Research

Environmental differences arise when one goes for global markets. Marketing Environment: In assessing the marketing environment, specific consideration should be given to the following

- Variety and assortment of products available,
- Pricing policies,
- Government control of media,
- The public's attitude towards advertising,
- The distribution system used to reach the mass market,

- The level of marketing effort undertaken for awareness creation and brand penetration levels
- Behavior of the consumers.

For example, developing countries tend to focus on production of basic goods although developed countries tend to be consumer oriented. Consider the following differentiators

Surveys conducted in the United States usually involve questions on the variety and selection of merchandise. These questions would be inappropriate in many countries, such as in Eastern Europe, which are characterized by shortage economies. Likewise, questions about pricing may have to incorporate bargaining as an integral part of the exchange process in India.

Television advertising, an extremely important promotion vehicle in the United States, is restricted or prohibited in many countries where TV stations are owned and operated by the government. Certain themes, words, and illustrations used in the United States are taboo in some countries.

Government Environment

The government environment affects marketing research because it has a bearing on the emphasis on public policy, regulatory agencies, government subsidies, incentives and penalties, and investment in government enterprises. At the tactical level, the government determines tax structures, tariffs, product safety rules and regulations, promotion, and often imposes special rules and regulations on foreign multinationals and their marketing practices. Also, the role of government in setting market controls, developing infrastructure, and acting as an entrepreneur should be carefully assessed.

Governments, particularly in developing countries, do not encourage foreign competition. Till 1991, before economic reforms were introduced, our country had a protectionist policy and barred entry of several foreign companies. Recently, government has relaxed the conditions for FDI in retailing and it opened doors to giants like Walmart. In India, government takes active role in distribution of essential commodities through its Fair Price shops.

Legal Environment

The legal environment affects international marketing research. The laws related to products include patents, trademarks, and copyright, health & safety, warranty and after-sales service. Laws on pricing deal with price fixing, price discrimination, price controls, and retail price maintenance. Distribution laws relate contracts, transportation safety rules and licenses for distribution. Promotion relates to use of certain words, sex portrayal, and restrictions on advertising some products.

Although all countries have laws regulating marketing activities, some countries have only a few laws that are loosely enforced, while others have many complicated laws that are strictly enforced. In many countries the legal channels are clogged and the settlement of court cases is prolonged. In addition, home-country laws may also apply while conducting business or marketing research in foreign countries.

Economic Environment

Economic environment is the major determinant of the success or failure of a firm's marketing. The salient factors are

A country's stage of economic development determines the degree of modernization, and innovative readiness of the market. It determines the purchasing power, preference to services and comfort products, ability to buy insurance, banking and communication products, etc. Today Indian middle class is poised for purchase of high end products and even its rural markets are becoming brand conscious.

Information and Technological Environment

The informational and technological environment includes information and communication systems, extent of computerization, use of electronic equipment, energy, development, production technology, science, and invention. Each of these elements will dramatically affect the types of research that can be conducted.

Example: In India, South Korea, and many Latin American countries, advances in science and technology have not had a proportionate

impact on the lifestyle of the common citizens. Computers and electronic information transfer has still to make an impact at the grass-roots level. Information handling and record keeping are performed in the traditional way. This, again, has an impact on the type of information that can be solicited from consumers, businesses, and other enterprises.

Socio-Cultural Environment

Socio-cultural factors influence the practice of marketing research. The primary factors are values, literacy, language, religion, communication patterns, and family and social institutions. Relevant values and attitudes toward time, achievement, work, wealth, scientific method, risk, innovation, change, and the Western world should be considered. The marketing research process should be modified so that it does not conflict with cultural values.

Factors Influencing Research Method

The following factors influence the different stages of research.

- Because of the cultural influence on interpretation of qualitative data, moderators should not only be trained in focus group methodology, but also be familiar with the language, culture, and patterns of social interaction prevailing in that country.
- For focus groups the findings should be derived not only from the verbal contents but also from nonverbal cues such as voice intonations, inflections, expressions, and gestures used in that country or culture.
- Projective techniques do not impose a specific cultural referent on the respondents.
- Whether verbal or nonverbal stimuli are used, the equivalence of meaning across the cultures should be established. This can be a difficult task if the socio-cultural environment in which the research is being conducted varies greatly.
- Note that considerations must be given to the local conditions within the foreign market. For example, the penetration and reliability of telephone service will largely determine the effectiveness of telephone interviewing.

- The use of in-home personal interviews will be determined by the relative cost of personnel for interviewing and cultural factors, like admitting strangers into one's home.
- Mall intercept interviews are most popular in Canada and the United States. However, in Europe Street interviews represent a similar mode of interviewing, presumably because these forms offer the advantages but not the cultural taboos of in-home personal interviews.
- Mail interviews require a high literacy rate, an explicit list of addresses to include in the sample, cultural norms for communicating via mail, and reliable postal systems. Mail panels are limited to developed nations that possess the required technology.
- No questionnaire administration method is superior in all situations. The method(s) which is (are) best capable of meeting the data collection needs in a given marketing research project should be selected.
- If a high degree of sample control is required, mail surveys are not a viable option.
- The difficulty of reaching respondents at home may make the use of personal interviews infeasible.
- The unavailability of a large pool of trained interviewers is another factor that would hinder the use of personal interviews. If a large percentage of the survey population lives in rural areas, as in many developing nations, personal interviews become the favored mode.
- The existence of certain documents may determine the mode chosen. Maps are essential to personal interviews and mailing lists to mail surveys. Telephone directories are essential to conducting both telephone and mail surveys.
- A low penetration of telephones in the homes would make telephone interviewing infeasible for most consumer surveys.
- Likewise, the lack of an efficient postal system would argue against the use of mail surveys. The levels of literacy should be taken into account while selecting a data collection method.
- Linguistic heterogeneity would force the questionnaire to be

administered in different languages in countries speaking a diversity of languages. In addition to understanding the language, we must understand the habit, culture, social behaviour, and consumption patterns of the country in which the research is being conducted.

- Finally, a very important consideration in selecting the methods of administering questionnaires is to ensure equivalence and comparability across countries.

Internet and International Marketing Research

1. The Internet and computers can be extensively used in all phases of the international marketing research process. These uses parallel those of domestic marketing research.
2. The fact that the Internet can be used to communicate with respondents anywhere in the world has given a new dimension to international marketing research.
 - For example, the online survey overcomes geographic boundaries by soliciting responses from around the world.
 - The online survey also takes advantage of one interviewer (the computer) that can present the same survey in several different translations.

Summary

We brought out the importance and difficulties of international marketing research and a discussion is added on areas where differences may arise in international marketing research and issues in conducting international survey research. Also an introduction is given about the factors the researcher should consider when selecting a survey method and significance of internet in international marketing research.

Review Questions

1. What are the peculiarities of international marketing research?
2. Identify the factors influencing research method in different countries
3. What is the influence of internet on international marketing research?

Discussion Question

Some scholars have argued that the same standardized marketing strategy should be adopted for all foreign markets. Does this imply that the marketing research process should also be standardized and the same procedures followed no matter where the research is being conducted?

Mini-Project

Visit a local business with international operations. Discuss with them some possible international marketing research projects they could undertake.

Self Assessment question

1. Research is not without limitations. In such cases, how can a marketer rely on research data and the findings? Discuss.
2. Mini-project
3. Collect five research papers and examine how the researchers have stated the research methodology adopted in their studies.
4. A problem well defined is problem half solved –Discuss.
5. Of all the sources of information, intelligence is the best source as it helps manager, to develop intuitive abilities. Discuss.
6. Define marketing research.
7. Distinguish between basic and applied research and problem identification and problem solving research with suitable examples.
8. How does marketing research help in decision making stages of managers?
9. In what decision areas of marketing, research can help managers?
10. When do you, as a marketer prefer to conduct marketing research?
11. Name some of the marketing research firms and identify their activities.
12. What are the recent trends in marketing research?
13. Outline the steps in marketing research.
14. Briefly discuss problem definition phase in the marketing research project.

15. How are the objectives and hypotheses formed?
16. What are the problems faced by researcher in interacting with managers for designing a research project?
17. Explain the concept of a model. What is its use in research?
18. What are the limitations of research?
19. How do you make research effective?
20. Compare and contrast the exploratory, descriptive, and causal research designs.
21. Explain the methods of data collection in exploratory research
22. Elaborate the purpose and methods of descriptive research
23. State the purpose and methods of causal research.
24. Define cross-sectional design and longitudinal design. What are the relative advantages and disadvantages?
25. Discuss how the Internet can facilitate the implementation of different types of research designs.
26. How important is an information system to a company's success?
27. What are the major sources of input for a decision support system?
28. Give three examples of computerized databases that are available in your college or university's library?
29. Explain the benefits of DSS with an example.

CASE STUDY

Indian Toilet Soap Category

Introduction

The Fast Moving Consumer Goods (FMCG) sector is the fourth largest segment of the Indian economy. This sector includes items of personal care, household care, packaged foods, beverages, spirits, tobacco, et al. The Indian FMCG industry which was valued at INR 48,000 crores in 2003 (\$ 11.6 billion) reached ₹ 74,650 crores in 2006-07 (\$ 16 billion). It further grew by 16 per cent in 2007-08 (Rs. 85000 crores) as compared to a growth of 14.5 per cent in the previous fiscal (FICCI report, 2008).

The FMCG sector employs more than three million people in production and related downstream activities. A distinct feature of the FMCG sector is the presence of global players through their subsidiaries (Hindustan Unilever Limited, Procter & Gamble, Nestle, etc), which ensure frequent new product launches in the Indian market from the parent company portfolio. Demand for FMCG products is set to boom by more than 100 per cent in 2015. Most of the Indian FMCG companies are currently attempting to focus on urban markets for value and rural markets for volumes .

Like any other industry, FMCG also passed through rough weathers. During 1998-2000, overall value growth for FMCG products had fallen from a robust 25.4 per cent to 7.2 per cent. The slowdown was most acutely felt in northern and western India, where growth rate fell from 29 to 3.9 per cent and from 29 to 4.9 per cent respectively . However, southern India showed signs of prosperity with 11.9 per cent growth along with Eastern India (10.4 per cent) during the same period. Overall growth in volume was very low, hovering around 1-5 per cent during 1996-2000.

The year 2000 was a year of negligible growth after the boom in the late 1990s. Most FMCG categories witnessed negative growth or low single digit growth during the first half of the year 2001. Soaps, detergents, oral care products, skin care products, beverages, milk products, baby food items witnessed a flat or negative growth rate. The exceptions were a few categories such as edible oils, branded staples, bakery products, chocolates, mosquito repellents, shampoo, hair dyes and sanitary napkins

which registered positive growth rates in the range of 5 -15 per cent. Major corporate houses reacted through measures like line pruning (Power Brand Strategy by HLL), supply chain management (P&G initiatives in Efficient Consumer Response-ECR), and improving productivity measures (Tata Tea).

The difficult market conditions were also reflected in the financial results of most FMCG companies. Overall, sales growth was sluggish in relation to the previous year. With exceptions like Nestle India, Cadbury India and Smith Kline Beecham Consumer Healthcare , most of the companies found it difficult to register a double-digit growth rate.

The trend of poor growth rate (in both value and volume) continued during the year 2002 for most of the FMCG categories - packaged tea (-9.4 per cent in value; -9.2 per cent in volume), washing powder / liquid (-2.8 per cent in value; -5.4 per cent in volume), detergent cake (-0.6 per cent in value; -2.9 per cent in volume) and toilet soaps (-6 per cent in value; -11 per cent in volume) all witnessed a negative growth rate. Notable exceptions to this trend were biscuits with 10.3 per cent value growth rate and refined oil with a growth of 25 per cent in value. The toilet soap industry finished the year 2002 with a total sales turnover of ₹ 4,800 Crores.

In the year 2003, the FMCG industry showed an overall growth of 2.7 per cent with select categories like toothpastes, detergents, and packaged tea continuing to remain in the negative growth rate region. Toilet soap category, which contributed nearly 10 per cent of the industry sales, showed a mild recovery and registered a 2.7 per cent growth over 2002. Cumulative average growth rate (CAGR) for various FMCG categories for the period 1999-2003 showed low growth rates except for categories like biscuits (10 per cent), washing powders (six per cent), shaving creams (20 per cent), deodorants (40 per cent), branded coconut oils (10 per cent), anti dandruff shampoos (15 per cent), hair dyes (25 per cent), cleaners and repellents (20 per cent). Categories like toilet soaps, detergent washing bars, toothpastes, and tea still suffered from low and weak growth and most FMCG categories exhibited unfavourable or stagnant market conditions.

S.No	Category	Contribution of the category to the industry	Growth percentage (2003 over 2002)	CAGR 2003 / 1999
1	Toilet Soaps	10 %	2.7	1.1
2	Washing Powders/ liquids	7 %	0.1	5.5
3	Biscuits	7 %	11.7	9.8
4	Packaged Tea	6 %	-10.0	-3.7
5	Detergent Cakes and bars	5 %	-4	0.2
6	Tooth Pastes	4 %	-9.7	0.9

FMCG Industry Scenario After 2004

The twelve major FMCG companies manufacturing detergent, toiletries, liquid soaps, hair oils and shampoo posted a record growth of 6.43 per cent in sales in the last quarter of 2004 - 2005 — the highest since 2001. For February 2005, the industry recorded an 8 per cent growth rate, while the moving annual total (MAT, i.e., for the 12-month period ended February 2005) growth was placed at 6.3 per cent. Most of the big categories showed a fluctuating trend - toilet soaps recorded a growth of 4.1 per cent while biscuits grew by 11.3 per cent. For the quarter ended December 2004, urban markets grew by 9.9 per cent while rural markets declined by 0.8 per cent. The growth rate in January-March 2005 reflected a similar trend, with rural markets recording a flat growth rate.

The survey released by FICCI estimated that the industry was poised to achieve an overall growth between 8-8.5 per cent for the year 2005-06, up by 2-2.5 percentage points over the growth rate clocked in the previous year . The categories that were projected to achieve high growth between 10 - 20 per cent included soap and toiletries (14 per cent), toothpaste (10 per cent), personal health care (12 per cent), oral care (12 per cent), skin care and cosmetics (11 per cent), skin/ fairness cream (12 per cent), branded coconut oil (18 per cent), feminine hygiene (12 per cent), and dish wash (10 per cent). The survey also noted that growth in

urban markets has been much faster at about 7 per cent and that there has been revival in rural markets, though at a relatively slower rate of about 4 per cent . The Indian FMCG industry witnessed a strong growth and sales grew from INR 585 billions in 2005 to INR 713 billions in 2006 (22 per cent growth).

The FMCG industry which underwent rough conditions during the years 2000 - 2004 came out successfully mainly due to the upswing in the country's economy - this also led to growth in per capita income, demographic profile dynamics, population growth, better employment opportunities, and higher disposable incomes. In 2006, urban India accounted for 66 per cent of total FMCG consumption, with rural India accounting for the remaining 34 per cent. However, rural India accounted for more than 40 per cent of the consumption in major FMCG categories such as personal care, fabric care, and hot beverages. Rural households in India account for about 12 per cent of the world's population and they need to be considered as a potential market.

There is intense competition in every market category due to the large number of players in each segment. Therefore, it is imperative that any sound marketing strategy seeks to understand the customers' requirements and shape their product and policies accordingly. The FMCG market segment provides a wide scope of research interest from various managerial perspectives due to diverse paradigm shifts and changes.

Indian Toilet soap Category

Among the various FMCGs', the soaps and detergents industry enjoys very high penetration levels in both urban and rural areas. The soaps and detergents industry comprises washing products (laundry soaps and synthetic detergents) and toilet soaps (including bathing bars). These are consumer items and factors like technology, quality, marketing, and distribution strategies determine the success of the firms in the sector. The soap industry in India falls under the "delicensed goods" category and has witnessed growth both in the unorganised (small-scale) sector and the organised sector. Ninety per cent of the production of laundry soap is in the small-scale sector .

Toilet soaps, however, is dominated by the large-scale units. The leading players in this market are Unilever's Indian arm HUL, Nirma,

Godrej Soaps, Reckitt and Colman, etc. Leading brands include Hamam, Lifebuoy, Pears, Nirma, Cinthol, Mysore Sandal, Liril, Dove, and Lux.

Category	All India (In percentage)	Urban (In percentage)	Rural (In percentage)
Deodorants	2.1	5.5	0.6
Toothpaste	48.6	74.9	37.6
Skin Cream	22	31.5	17.8
Shampoo	38	52.1	31.9
Utensil Cleaner	28	59.9	14.6
Instant Coffee	6.6	15.5	2.8
Washing Powder	86.1	90.7	84.1
Detergent Bar	88.6	91.4	87.4
Toilet Soap	91.5	97.4	88.9

(Source: HLL investors meet 2006)

The toilet soap industry in India is divided into sub categories of Premium, Popular, Discount and Economy based on unit price. The Economy brands are priced around INR 10 /- for 75 gm while Premium brands cost above INR 25 /-. Popular and Economy categories together accounts for nearly 67 per cent of total industry sales with the popular soaps segment having about 42 per cent market share and the economy category having a market share of 25 per cent.

The toilet soap industry witnessed single digit growth rate from 1996 onwards with 1998 showing the lowest growth (1.8 per cent). Even during the years 1999-2003, the toilet soaps category had struggled to manage growth rate of 1.1 per cent against the overall FMCG growth of 4.4 per cent.

Year	Volume (tones)	Growth rate (percentage)
1996	4,32,254	3.6
1997	4,48,141	3.7
1998	4,56,040	1.8
1999	4,71,000	3.3
2000	4,93,800	4.8

(Source: Chemical Weekly)

Toilet soaps contributed nearly 10 per cent of ₹ 47, 800 crores during 2002-03, but this market of ₹ 4800 crores declined by around 6 per cent in 2003 . In 2004-05, the toilet soap segment grew at 6.5 per cent (FICCI 2005-06 survey). However, this market segment continued to be subject to changing market dynamics and the ₹ 6,500 crores Indian toilet soap category registered a negative growth of 4 per cent in the October-December quarter of 2007 . For the year ended 2007-08, FICCI confirmed a low growth rate of six per cent .

If you are a manager for a FMCG firm that sells toilet soaps and in-charge of business forecasting, market research support for the policy initiatives of the firm, the top management wants to assess the current market scenario. What would be your specific research aims / objectives to address the reasons for such fluctuations in the market?

Case study prepared by R.Venkatesakumar for classroom discussions (November 2008). The author is very thankful to the Research Supervisor Prof. Dr. P. Ganesan, VIT Business School, VIT University for shaping up the research project.

UNIT-II

Unit Structure

Lesson 2.1 - Sampling Decision

Lesson 2.2 - Sampling Design and Procedure

Lesson 2.3 - Sample Size Determination

Lesson 2.1 - Sampling Decision

Learning Objectives

- To explain the concept and need for sampling
- To understand the measures involved in sampling

Introduction

Sampling is one of the key decisions in research process; for example, a leading consumer product company faces competition for its tea brand. The sales team strongly felt, the company is losing its market share to its competitors, particularly in the adjacent districts of the state capital. Adjacent districts of the state capital are always potential market for any tea/coffee manufacturers, since it is easy to go and work. The company wants to undertake a market research in this area. If we assume, the adjacent districts population is roughly about 50, 00,000 people, how many people should the company study to draw meaningful conclusion?

Obviously, the company cannot meet all the people in the districts and conduct the study and draw meaningful inferences. Marketing research projects like this usually have budget and time constraints. Neither, it would not be possible to contact the whole population within a short

period of time, nor adequate resources [both man power and financial support] to undertake the study. Thus, sampling is a handy tool, which cuts costs, reduces manpower requirements, and gathers vital information quickly.

Concept of Sampling

A population (finite group) or universe (infinite group) is any complete group sharing some common set of characteristics. Sample is a subset or some part of a larger population.

Sampling involves using a small number of items or parts or portion of the population to make conclusions regarding the whole population. Thus, the purpose of sampling is to estimate some unknown characteristic of the population.

For instance, if you conduct a study on brand preference for tea/coffee product in adjacent districts of the state capital, the adjacent districts will constitute the population for your study; if you want to conduct a dealer satisfaction survey for a Cement Manufacturer (Say XYZ Ltd), then those dealers, appointed by the company will be the population for your study; if you conduct a study on mobile user satisfaction survey among the students in a university for a mobile service provider, then, those students of the university, who use a particular brand of service will be the population for the study.

Thus, sampling is the process of selecting units, which may consist of people / organizations, from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they are chosen.

Measures in Sampling

The terminology that describe sampling measures are response, statistic and parameter.

Response

It is a specific measurement value that a sampling unit supplies. For example, if a respondent is responding to a survey instrument and gives a response of '4'. Such responses we collect for the sample.

Statistic

Based on the responses, we compute a value for our entire sample. That value is called a statistic. There are a wide variety of statistics we can use — mean, median, mode, and so on.

Parameter

If you measure the entire population and calculate a value like a mean or average, we call it a parameter of the population.

- **Parameter:** The actual characteristic of the population, the true value of which can only be known by taking an error-free census
- **Statistic:** The estimate of a characteristic obtained from the sample

Population element refers to an individual member of the population.

Census is an investigation of all the individual elements making up the population - a total enumeration rather than selection of portion from the whole population.

If you are conducting a dealer satisfaction survey for a new marketing company, the firm may be more interested to know the satisfaction level of each and every dealer it has appointed; in this instance, you may be collecting data from each and every element of the population or you are doing a census based study; on the other hand, if the firm is interested to know only those dealers who are producing more volume sales, but the total number of dealers is in 1000s and spread across the entire country, it may be difficult for a researcher to make a field trip and collect data from all the population members. In this case, the firm may prefer to select a small portion and try to make inferences from that; thus, sample is a small portion, which possesses the characteristics of the population.

- *Census*: It is process making an investigation / study of all the individual elements making up the population.
- *Sample*: It is a small portion of the population, which possess the characteristics of the population.

Population Types

You should also know the distinction between the population you would like to generalize to, and the population that will be accessible to you. We will call the former the theoretical population and the latter the accessible population.

- *Theoretical population*: This is the population for concern for the researcher, for which he/ she is trying to generalize the research findings.
- *Accessible population*: These are the population elements, which the researcher feels possess universe characteristics, and can be claimed as a representation of the 'true', theoretical population, and within a reasonable effort, he/she can collect data

Target Population and Sampling Frame

Another concept is the target population. Once the decision to sample has been made, the first question concerns identifying the target population. What is the relevant population?. The following key parameters might be more useful to define the target population accurately.

- Well thought out research objectives
- Available alternatives for data collection
- Knowledge of market size and characteristics
- Considerations regarding the appropriate sampling unit
- Identification of what is to be excluded
- The possibility of repeating survey with them- reproducible
- Convenience

Consider the following example.

Objective - A tea marketing company, plans to study the competitor activities to reason out its declining market share.

Alternatives –It has two options: (i) retailer study or (ii) consumer study to find reasons for the failure of product. It seeks to study the consumers.

Market size and characteristics – Now consideration is the target population. It is the population of the market it is covering as on today.

Sampling unit - Consider possible divisions/ sub groups available in the target population.

For example, the accessible population might be those coffee/tea drinking people, who often visit to tea shops, hotels, popular residential area, within a reasonable city limit.

Excluded: One needs to eliminate those who do not take tea, for taste or health reasons.

Reproducible – Can the sample units be available for contact next time. If we contact households we may be able to repeat survey. If we contact people at tea stalls, the survey can be done but with different people. Ability of any other researcher to reproduce the marketing research process is an evidence of extent of scientific approach employed in a research. Particularly ability of reassuring the population / define the exact population again is very difficult task, and it is proof of how scientifically the population has been defined. This will automatically eliminate those elements that are not part of the designated population.

Convenience - This may be purely based on convenience; whether such divisions of population cover all the alternatives is a crucial check before he/she executes the marketing research process.

A sampling frame is a list of elements from which the sample may be drawn. The sampling frame is also called the working population, because it provides the list that can be operationally worked with.

Target population – It is the population the researcher would like to study for the given objective.

Sampling frame – It is the enumerated list of target population elements that can be identified and accessed for data collection.

Sampling frame error- The discrepancy between the definition of the population and a sampling frame is the first potential source of error associated with sample selection.

For instance, you are able to identify perfectly the population of interest, say the full information of the people who live in adjacent district of the state capital, you may not have access to all of them. And even if you do, you may not have a complete and accurate enumeration or sampling frame from which to select. And, even if you do, you may not draw the sample correctly or accurately – since many houses might be locked on that day or people who lived in the street would have left that area and yet to update their residential details with government agencies like Panchayat Office / Postal Department and so on. And, even if you do, they may not all come and co-operate with our research work. This results in sampling frame error.

Sampling Frame Error

Sampling frame error occurs when certain elements are excluded or when the entire population is not accurately represented in the sample frame. It is possible for elements to be either over- or underrepresented in a sampling frame.

Census vs. Sample

The decision to use population for survey is influenced by the following factors.

Population size itself is quite small - For example, if you are conducting a market survey of forecasting the sale of automobiles, using expert opinion, you may directly contact the officials of the manufacturers who are very less in number. If you want to study the new product development process for soft drink manufacturing firm, only 5-6 major firms are in the country, you may prefer to meet all top officials of these firms and come to conclusion. Thus, when the number of elements is very small in a population, the researcher would like to meet all the elements and draw conclusion rather than selecting a small portion of it.

Information is needed from every individual in the population-

When the study is of strategic importance, and cannot afford to miss any member as a choice.

For example, if a pollution control board conducts a survey for acceptability of newer technology in an industrial cluster like Ranipet [Vellore] , they need information from each and every member of the industrial estate.

Cost of making an incorrect decision is high – Sample studies result in some errors. When such errors are not tolerable, census study is right alternative. On certain occasions the researcher would prefer to use sampling rather than census method to draw conclusions.

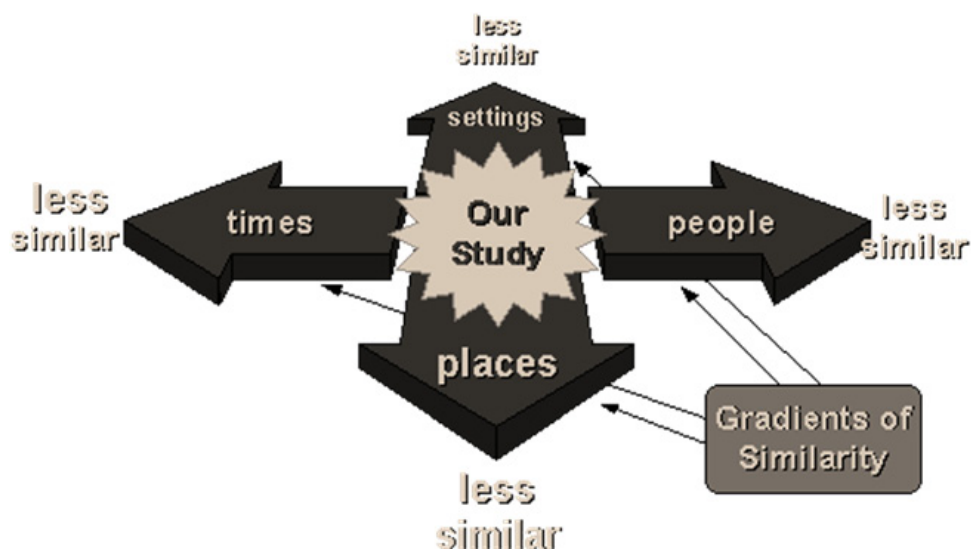
Used if census is impossible- In case of consumer goods companies, like the tea manufacturing firm, it would be highly improbable to meet the entire population. In such cases, it would be preferable to undertake sample survey rather than census method.

Quick decision is needed - Sometimes a company might be looking for information at the earliest time frame to take a quick decision. For example, a marketing company, of Liquid Pain Balm product, faced competition. The competitor lowered prices. What should be done? The company already spent huge amount on promotional programmes like advertisement, trade and consumer promotions. If the price is lowered, will consumers think it a low quality product? Is it necessary to reduce price? If decision is not taken immediately, firm may lose sales.

Infeasibility of studying population - The cost associated with the project is always a constraint for any marketing research project. If population study benefits are larger than costs of studying population, it is advisable to study population. Otherwise, sample is the right alternative.

Homogeneous population - If the firm conducts a study on a population, which is highly homogeneous, it is sufficient to conduct the study based on samples rather than a complete enumeration. For example, if the study is to understand the spending pattern of the sales force, who are in-charge of all the retail outlets and dealer management in their respective territory, the spending pattern of the sales force is highly homogeneous; the

travel, other incidental expenses are expected to be highly homogeneous; so one would prefer to use sampling rather than census.



Generalisability of findings

Large scale study, may also be less correct due to the difficulty in supervising the large number of investigators engaged for data collection. When we take sample, the key question is the generalizability of the research findings. Before we generalize, the researcher might imagine several settings that have people who are more similar to the people in his/her study or people who are less similar and whether this also holds good for times and places. When the researcher places different contexts in terms of their relative similarities, he can call this implicit theoretical a *gradient of similarity*. Once he has developed this proximal similarity framework, then he would be able to generalize.

Thus, the researcher might conclude that the findings can be generalized to other persons, places or times that are more like (that is, more proximally similar) to our study. Notice that here, we can never generalize with certainty -- it is always a question of more or less similar.

Easier to manage and exercise quality control - When the firm wants to conduct a large scale survey, it needs to put greater efforts to train the field executives to collect data in proper ways. Sampling method normally can have higher control over the data collection and improve the quality of the responses obtained from the respondents.

When In-depth information is required – If sample is used, the investigators can spend more time with each respondent and clarify all the doubts arising while interviewing, thereby can improve the response quality.

Summary

Sampling is one of the key decisions in research process. This chapter introduces various concepts associated with sampling and answered the crucial question- when he should use sampling rather than census and vice-versa. It has provided a discussion on the basic decisions by which one determines the size of a simple random sample.

Discussion Question

Quantitative considerations are more important than qualitative considerations in determining the sample size.” Discuss

Mini-Project

Visit a local marketing research firm. Find out how the sample sizes were determined in some recent surveys or experiments. Write a report about your findings?

Lesson 2.2 - Sampling Design and Procedure

Learning Objectives

- To introduce the sources of random sampling and non-random sampling errors
- To explain Probability and Non-Probability Sampling methods
- To discuss various factors influencing the design of the sample

Introduction

A researcher investigating a population with an extremely small number of population elements may elect to conduct a census rather than a sample because the cost, manpower, and time drawbacks are relatively insignificant. On the other hand, sampling is preferred when there are cost, resource, and time advantages. In some cases, sampling can be very accurate, and, in some cases, more accurate than a survey.

Sampling Errors

Investigators expect a sample to be representative of the population. However, errors occur

Statistical Error

It is the difference between the value of a sample statistic of interest (for example, average-willingness-to-buy-the-service score) and that of the corresponding value of the population parameter (again, willingness-to-buy score). It is classified into: random sampling errors and systematic (non-sampling) errors.

- **Random sampling error** Random sampling error occurs because of chance variation in the scientific selection of sampling units. Random sampling error is a function of sample size. As sample size increases, random sampling error decreases.

- **Systematic (non-sampling) errors** This type of errors are not due to sampling. They are result of a study's design and execution. Sample biases account for a large portion of errors in business research.

Random sampling errors and systematic errors associated with the sampling process may combine to yield a sample that is less than perfectly representative of the population. As such, researcher has to make use of scientific approach for sampling.

Probability Versus Non-Probability Sampling

The major alternative sampling plans may be grouped into probability techniques and non-probability techniques.

- **Probability sampling** every element in the population has a known nonzero probability of selection; each member of the population has an equal probability of being selected.
- **Non-probability sampling**, the probability of any particular member of the population being chosen is unknown.

Non Probability Sampling Techniques

In non-probability sampling, the probability of any particular member of the population being chosen is unknown. As there are no appropriate statistical techniques for measuring random sampling error from a non-probability sample, the results cannot be generalized.

We can divide non-probability sampling methods into two broad types: accidental or purposive.

Most sampling methods are purposive in nature because we usually approach the sampling problem with a specific plan in mind. For example, if the researcher would like to conduct 'customer experience management survey' he would prefer to stay near a theme park and conduct survey with the customers / visitors, who have at least one visit to the theme park to respond the questions.

Convenience Sampling:

Convenience sampling (also called haphazard or accidental sampling) refers to the sampling procedure of obtaining / gathering responses from the people who are most conveniently available. For example, a college professor wishes to conduct a media study- say celebrity endorsement and recall rate / credibility of the celebrity endorser, taking a sample of youth. He uses his or her students as it is convenient.

Convenience sampling is the least expensive and least time consuming of all sampling techniques. The sampling units are accessible, easy to measure, and cooperative. In spite of these advantages, this form of sampling has serious limitations. Many potential sources of selection bias are present, including respondent self-selection. Convenience samples are most suited for an exploratory research stage. It forms basis for additional research to be conducted with a probability sample Convenience samples can be used for focus groups, pretesting questionnaires, or pilot studies. Even in these cases, caution should be exercised in interpreting the results. Nevertheless, this technique is sometimes used even in large surveys.

Quota Sampling

This is another accidental sampling method. When the population is not homogeneous, it is necessary to create representation for each of such groups in the study. The purpose of **quota sampling** is to ensure that the various such subgroups in a population are represented on pertinent sample characteristics to the exact extent that the marketing researcher desire. In quota sampling, the interviewer has a quota to achieve.

For example, an interviewer in a particular city, who conduct coffee/tea drinkers habits/satisfaction/brand preference may be assigned 100 interviews, in which 40 respondents may be taken from residential area, 30 respondents may be taken from tea shops and 15 respondents may be from the hotels, 10 respondents may be from government/private offices and 5 may be student population. Thus, by collecting samples from various interview quotas yields a sample representing the desired proportion of the subgroups. There are two types of quota sampling – namely, *proportional* and *non proportional*.

1. *Proportional quota sampling method*, if you want to represent the major characteristics of the population by sampling a proportional amount of each. For instance, in the theme park study, if you know the population has 60 per cent youth/college –school students and the remaining 40 per cent are general public/household visitors of elderly age group, and that you want a total sample size of 100, you will continue sampling until you get those percentages and then you will stop. So, for example, if you have already got the 40 general public/household visitors of elderly age group for your sample, but not the sixty youths /college –school students, you will continue to sample youth/college –school students but even if legitimate elderly age group respondents come along, you will not sample them because you have already “completed your quota.”
2. *Non-proportional quota sampling* is a method with least restrictions. In this method, the marketing researcher specifies the minimum number of sampled units you want in each category. However, the researcher is not concerned about the numbers that match the proportions in the population. Quota samples have the tendency to include people who are easily found, willing to be interviewed, and middle class. In spite of these limitations, the method has various advantages, which include speed of data collection, lower costs, and convenience. Although there are many problems with this method, careful supervision of the data collection may provide a representative for analyzing the various subgroups within a population.

Judgment Sampling

Judgment or **purposive sampling** is another non-probability technique in which an experienced individual selects the sample upon his or her judgment about some appropriate characteristic required of the sample members. For example, a fashion manufacturer regularly selects a sample of key accounts that it believes are capable of providing the information to predict what will sell in the nearer time period; the sample has been selected to satisfy a specific objective.

If a garment manufacturing company desires to introduce ‘organic cotton product’ in India- obviously these garments manufacturing

requires a newer technology, different kind of raw material, expected to be priced higher than the 'premium' brands in the market. If a market research for consumer acceptance of these goods is initiated, one needs to make use of those sample respondents, who already use 'premium' brands regularly. Judgment sampling is often used in attempts to forecast election results. Political and sampling experts judge which small voting districts approximate overall state returns from previous election years. Of course, the assumption is that the past voting nature of these districts is still representative of the state's political behaviour.

This approach has been found empirically to produce unsatisfactory results more often than expected. Moreover it is difficult to evaluate the reliability of such samples. This method may be more useful, when the total population size itself is a small number.

Snowball Sampling

In this initial respondents are selected by probability methods, but additional respondents are then obtained from information provided by the initial respondents. This technique is used to locate members of rare populations by referrals.

For Example, if you are interested to conduct a study on Information Technology Entrepreneurs marketing strategy / new product development strategies, it would be difficult to undertake probability sampling method; since entrepreneurs may be reluctant to share the information with you. In this instance, the methods like snow ball sampling could be very handy. If you convince the president of an IT Entrepreneur Association, he will give some references to generate responses. You contact them and ask them to recommend others who they may know.

Snowball sampling is especially useful when you are trying to reach populations that are inaccessible or hard to find. Reduced costs and sample sizes are the major advantages of snowball sampling. There is a chance of potential bias likely to take the centre stage of the study, because a person who is known to someone also in the sample has a higher probability of being similar to the first person. If there are major differences between those who are widely known by others and those who are not, there may be some serious problems with this technique. Since the focus group is

not expected to be a generalized sample, snowball sampling may be very appropriate.

Probability Sampling Techniques

If the researchers are interested in ensuring maximum precision and accuracy in a sample, then probability sampling is the answer for them. Probability sampling method is any method of sampling that utilizes some form of random selection of sample elements from the population. In order to have a random selection method, you must set up some process or procedure that assures that the different units in your population have prior defined probabilities of being chosen.

Simple Random Sampling

A simple random sample is a sampling procedure that assures that each element in the population will have an equal chance of being included in the sample.

Drawing names from a bowl is a typical example of simple random sampling; each person has an equal chance of being selected. When populations consist of large numbers of elements, tables of random numbers or computer-generated random numbers are utilized for sample selection.

The researcher has to make use of a table of random numbers, which are available in many statistical text books and open source materials, to assign random number for each respondent. Thus, a serial number random number is generated and assigned to each element of the population. Then, assuming a population of 99,999 or less, five-digit numbers are selected from the table of random numbers merely by reading the numbers in any column or row, by moving upward, downward, left, or right. A random starting point should be selected at the outset.

An Illustration of Selection Sample for a Dealer Survey

Let us assume that we are doing a dealer satisfaction research for a FMCG manufacturer like Hindustan Unilever Ltd [HUL] that wishes to assess various aspects of distribution and quality of service over the past year.

As a first step, the researcher has to define the sampling frame. To do this, we will go through dealers' records to identify every dealer for the past one /two years. As a next step, the researcher has to decide the number of dealers he would like to have in the final sample. For example, let us assume the researcher wishes to select 100 dealers to survey out of the 1000 dealers it has appointed. Then, the sampling fraction is $f = n/N = 100/1000 = .10$ or 10%. Now, to actually draw the sample of dealers, you have several options.

- You may write down or print off the list of 1000 dealers, tear the list into separate strips, put the strips in a big basket, mix them up real good, close your eyes and pull out the first 100. But this mechanical procedure would be tedious and the quality of the sample would depend on how thoroughly you mixed them up and how randomly you reached in.
- Alternatively, a better procedure would be to make use the kind of ball machine that is popular with many of the state lotteries [which once upon a time popular in many states of India]. You would need three sets of balls numbered 0 to 9, one set for each of the digits from 000 to 999 (if we select 000 we'll call that 1000). Number the list of names from 1 to 1000 and then use the ball machine to select the three digits that selects each person. The obvious disadvantage here is that you need to get the ball machines, which may be slightly expensive and you should have provisions in your budget.

Neither of these mechanical procedures is very feasible and little bit cumbersome; with the development of inexpensive computers there is a much easier way. One such simple procedure, especially useful, if you have the names of the clients already on the computer, programmes like MS-EXCEL can generate a series of random numbers. Let us assume that the researcher can copy and paste the list of all the 1000 dealers' names into a column in an EXCEL spreadsheet. Then, in the next column right column, paste the function `=RAND()` which is EXCEL command of generating random number between 0 and 1 in the cells. Then, you can sort both columns -the list of names and the random number – based on the random numbers. This will rearrange the list in random order from the lowest to the highest random number. Then, you have to take the first hundred names in this sorted list. This could probably accomplish within a minute time.

Among the many sampling method, this random sampling is simple to accomplish and is easy to explain to others. Because simple random sampling is a fair way to select a sample, it is reasonable to generalize the results from the sample back to the population. However, it is not the most statistically efficient method of sampling and you may, just because of the luck of the draw, not get good representation of subgroups in a population. To deal with these issues, we have to turn to other sampling methods.

Stratified Random Sampling

When population elements are heterogeneous, researcher cannot make use of simple random sampling.

A researcher selecting a stratified sample will proceed in the following stages. First, a variable (sometimes several variables) is identified as an efficient basis for stratification. The variable chosen should increase the homogeneity within each stratum and increase the heterogeneity between strata. The stratification variable is usually a categorical variable or one easily converted into categories, that is, subgroups.

Next, for each separate subgroup or strata, a list of population elements must be obtained. If a complete listing is not available, a true stratified probability cannot be selected. A table of random numbers or some other device is then used to take a separate random sample within each stratum. Of course, the research must determine how large a sample must be drawn for each stratum.

Proportional versus Disproportional Strata

If the researcher wishes to choose number of sampling units from each group / stratum is in proportion to the relative population size of the stratum, the sample is known as proportional stratified sample. However, if the primary purpose of the research is to estimate some characteristic of the total among strata, disproportional stratified sampling should be used.

For example, in the tea marketing company study, if the percentage of retail food outlets is not equal in size, there is a small percentage of large independent stores and a large percentage of other stores. To avoid under representing the medium-sized and smaller stores in the

sample, a disproportionate sample may be more appropriate and is taken.

In a *disproportional stratified sample*, sample size for each stratum is not allocated on a proportional basis with the population but dictated by analytical considerations. Thus, the strata exhibiting the greatest variability are sampled more heavily to increase sample efficiency, that is, smaller random sampling error. A simplified rule of thumb for understanding the concept of *optimal allocation* is that the stratum sample size increases for strata of larger sizes with the greatest relative variability.

There are several reasons for any researchers to prefer a stratified sampling over simple random sampling.

First, it gives an assurance for the researchers to represent not only the large size population, but also appropriate key subgroups of the population, especially small minority groups. If the researcher does not recognize such subgroups, many estimates from the sample may be wrong. For example, when you are conducting a study with various distribution partners like dealers, obviously, you need to divide the dealers based on their annual sales volume. Many firms, irrespective of the product categories, normally give higher importance for those views expressed by major dealers rather than those who do smaller volume / value.

A stratified random sample is recommended when the researcher desires to:

1. Increase a sample's statistical efficiency,
2. Provide for separate analysis of sub-populations, or
3. Enable different research methods and procedures to be used in various strata.

Systematic Sampling

Systematic sampling is extremely simple to apply: An initial starting point is selected by a random process; then every n-th number on the list is selected. To illustrate this procedure, suppose the researcher wishes to

take a sample of 100 dealers from a list consisting of 1000 names for a FMCG marketing company.

Using systematic selection every 10th name from the list will be drawn. In this example, the sampling interval is 10. The first step, you have to divide the entire dealer population into 100 groups of size 10 each; then should select a sample randomly from the first group – say the number -5 of the list; thereafter, you will be selecting 15, 25, 35... and so on.

While this procedure is not actually a complete random selection procedure, it does yield random results if the arrangement of the items in the list is random in character. The problem of periodicity occurs if a list has a systematic pattern, that is, if it is not random in character, however, periodicity is rarely a problem for most sampling in business research, but researchers should be aware of its possibility.

Advantages of Systematic Sampling

- Systematic sampling is less costly and easier than simple random sampling, because random selection is done only once. It does not require preparation of population lists.
- Systematic sampling can even be used without knowledge of the composition (elements) of the sampling frame. For example, every ith person leaving a department store or mall can be intercepted. For these reasons, systematic sampling is often employed in consumer mail, telephone, and mall intercept interviews.

Cluster Sampling

The purpose of cluster sampling is to sample economically while retaining the characteristics of a probability sample. In a cluster sample, the primary sampling unit is no longer the individual element in the population (for example, grocery stores or individual respondents or dealers) but a larger cluster of elements located in proximity to one another (for example, cities, two very large apartments consisting of 100s of houses). The area sample is the most popular type of cluster sample.

Cluster samples are frequently utilized when there are no lists of the sample population available. Ideally a cluster should be as heterogeneous as the population itself - indeed, a mirror image of the population. A problem may arise with cluster sampling if the characteristics and the attitudes of the elements within the cluster are too similar. To an extent this problem may be resolved by the cluster construction process that consists of diverse elements and by selecting a large number of sampled clusters.

Multistage Sampling

The four methods discussed above covered so far —simple, stratified, systematic and cluster—are the simplest random sampling strategies. In most real applied research situations, it will not so easy to select the respondents so easily; we may have to make use sampling methods that are considerably more complex than these simple variations. However, it is not a completely different method; this procedure combines the simple methods described earlier in appropriate manners which would help the researcher to address sampling related requirements more efficiently and effective manner as possible. Since, we combine many of the sampling methods, we call this multi-stage sampling.

Thus, multistage area sampling involves two or more steps that combine some of the probability techniques already described. It is possible to take as many steps as are necessary to achieve a representative sample. The Department of Census, Government of India provides maps, population information, and demographic characteristics of the population, and so on broken down into several small geographical areas that may be useful in sampling.

Internet Sampling

With the advent of internet surveys are organized using the medium.

Web Site Visitors

At the present time, many Internet surveys are conducted with volunteer respondents who by intention or happenstance visit an

organization's web site or willing to respond email communication, in which a survey link is attached.

These kind of unrestricted samples are clearly convenience samples. They may not be representative because of the haphazard manner by which many respondents arrive at a particular web site or because of self-selection bias.

A much better method for sampling the web site visitors is randomly select sampling units. For example, 'SurveySite', a company that specializes in Internet surveys collects data by using its "pop-up survey software". The software randomly selects web site visitors and the user of internet will receive "pops up", which is a small 'javascript' window, will be asking the user, if they want to participate in an evaluation survey.

To participate, a person has to select /click "Yes", upon which a new window opens up containing the online survey. The person can then browse the site at their normal pace and switch to the survey at anytime to express their opinions.

Panel Samples

Like many marketing research agencies who keep a panel of members permanently for the research purpose, it is possible for the researcher to have a panel of members with him/her. Drawing a probability sample from an established consumer panel or other pre-recruited, membership panel is a popular, scientific, and effective method for drawing Internet samples.

Typically samples from a panel yield a high response rate because panel members have already known the marketing research agency/ researcher and agreed to cooperate with the research organization via e-mail and the Internet. However, the panel members are compensated for their time and efforts with a small honorarium of sweepstake or a small, cash incentive.

Further because the panel has already supplied demographic characteristics and other information from previous questionnaires, researchers have the ability to select panelists based on product ownership, lifestyle, or other characteristics. A variety of sampling methods and data

transformation techniques can be applied to assure that sample results are representative of the general public or a targeted population.

Recruited Ad Hoc Samples

Another means for obtaining an Internet sample is to obtain or create an e-mail addresses sampling frame on an ad hoc basis. Researchers may create the sampling frame offline or online.

- Databases containing e-mail addresses can be compiled from many sources including customer/client lists, advertising banner recruiting survey participants, online sweepstakes, pop-up windows and registration forms that must be filled out in order to gain access to particular web sites.
- It is also a practice that researchers contacting respondents by snail mail or by telephone, ask for their email addresses, and obtain permission for an Internet survey. Using off-line techniques, such as random digit dialing and short telephone screening interview, to recruit respondents can be a very practical way to get a representative sample for an Internet survey.
- For companies anticipating future Internet research, adding an optional e-mail registration into customer relationship databases (product registration cards, telephone interactions, on-site registration, etc.) can prove to be a valuable database for sample recruitment.

However, by whatever means the sampling frame is developed, it is very important not to send unauthorized email to respondents. If individuals do not opt-in to receive e-mail from a particular organization - they may push these unsolicited survey requests to be spam. Also, certain email service providers directly send the survey emails to spam, whenever the source sends such emails to 100s of user. . Spamming is not tolerated by advanced Internet uses and can easily backfire to create a host of problems. The most extreme being complaints to the Internet service provider (ISP) and the ISP shutting down the survey site.

Opt-in Lists

Another means for obtaining an Internet sample is to obtain list of e-mail addresses from individuals who have given permission to receive e-mail messages related to a particular topic of interest. Survey Sampling Incorporated is a company that specializes in providing sampling frames and scientifically drawn samples.

There are websites where the researcher can try to conduct online surveys. For example, websites like 'SurveyMonkey.com', 'Qualtrics.com' provide wide range of options for the researcher to design a questionnaire to structure an analysis. The control panel provides variety of options / menu to the users; such as database choosing options – IP Trace – Remainder mails – Request to complete an incomplete survey to resume from where they left and analysis option.

Limitations of Internet Sampling

Randomly selecting web site visitors can create a potential problem; it is possible to over represent the more frequent visitors to the site, and thus represent site visits rather than visitors. There are several programming techniques and technologies that can help accomplish more representative sampling based on site traffic ("cookies", registration data, or pre-screening). Sampling potential respondents who are surfing the Internet is meaningful if the sample that is generated is representative of the target population. More and more industries are meeting this criterion.

In software, computers, networking, technical publishing, semiconductors, and graduate education, it is rapidly becoming feasible to use the Internet for sampling respondents for quantitative research, such as surveys.

For internal customer surveys, where the client's employees share a corporate e-mail system, an intranet survey is practical even if workers have no access to the external Internet. However, sampling on the Internet may not be yet be practical for any non-computer-oriented consumer products.

Factors Deciding an Appropriate Sampling Design

We will now briefly discuss the most common criteria involved in selecting a sampling design.

Degree of Accuracy of the Sample

The degree of accuracy required or the researcher's tolerance or the organisational prerequisites for sampling and non-sampling error may vary from project to project. Often accuracy is related to the type of research design as well; if the study seeks information,

which are highly technical or the respondents have to work and give responses, the population members find it difficult to understand the research/questions, various constraints like cost savings, time pressure or other considerations, which would lead to a trade-off for a reduction in accuracy.

Resources

If the researcher's financial and human resources are restricted, this limitation of resources will eliminate certain methods. If the organisation does not have a separate department to handle marketing research, the staffs, which are assigned to oversee the development from research work, could create issues.

Managers concerned with the cost of the research versus the value of the information often will opt for a cost savings from a certain non-probability sample design rather than make the decision to conduct no research at all.

Time

Researchers / organisations that have to meet a deadline or complete a project quickly will be more likely to select simple, less time-consuming sample designs.

Advance Knowledge of the Population

In many cases, a list of population elements will not be available to the researcher. A lack of adequate lists may automatically rule out systematic sampling, stratified sampling, or any other probability sampling design. Thus, it may dictate that the whole research work as preliminary study, such as a short telephone survey, mall-intercept surveys, and internet based surveys to conduct and generate information to build a sampling frame for the study of primary interest.

National versus Local Project

Geographic proximity of population elements will influence sample design sometimes. When population elements are unequally distributed geographically, a cluster sampling design may become much more attractive rather than simple random or any other methods.

Need for Statistical Analysis

The need for statistical projections based on the sample is often a criterion. Non-probability sampling techniques do not allow the researcher to utilize statistical analysis to project the data beyond the sample.

Summary

This lesson discussed meaning and the various advantages and disadvantages of each of the probability and non-probability sampling techniques. Also, it outlines and briefly discusses the most common criteria involved in selecting a sampling design.

Discussion Question

A major electric utility would like to determine the average amount spent per household for cooling during the summer. The management believes that a survey should be conducted. You are appointed as a consultant. You are asked to discuss with Chief Operating Officer, Chief Financial Officer, and the Chief Marketing Officer of this utility. –discuss.

Mini-Project

You work in the marketing research department of Burger King. Burger King has developed a new cooking process that makes the hamburgers taste better. However, before the new hamburger is introduced in the market, taste tests will be conducted. How should the sample size for these taste tests be determined? Organize a study.

Lesson 2.3 - Sample Size Determination

Learning Objectives

- Know the concepts relating to sample error
- Understand the concept of sampling distribution
- Explain the method of sample size determination

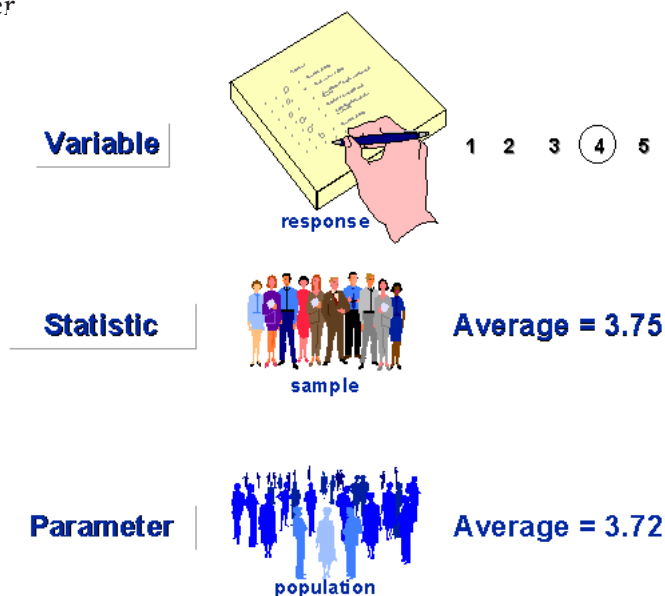
Introduction

The objective any sample selection is to draw conclusion about the population characteristics / parameters, which are often unknown – but fixed. To understand the process of sample size determination, you should know certain basic statistical theories. We will discuss them in short here.

Sampling Error

Any characteristic of the population related measure is called a parameter. It is a fixed value as long as the population does not change.

The picture shows population. Say it includes 1000 people and the average of their response is 3.72. It is known as population mean – a parameter



The picture also shows a sample. Let us say, it consists of 100 people. The sample mean is 3.75 and it is called a statistic.

The difference between the statistic and the parameter is called sampling error. Each sample will generate a different amount of sampling error. In this case it is $3.75 - 3.72 = 0.03$.

Sampling Distribution of Mean

The distribution of responses of sample elements form a sampling distribution with a mean and variations. To understand, let us to do an exercise. Imagine the population of 5 elements say [1, 2, 3, 4, 5]. The mean value of the population = $[1+2+3+4+5]/5 = 3$

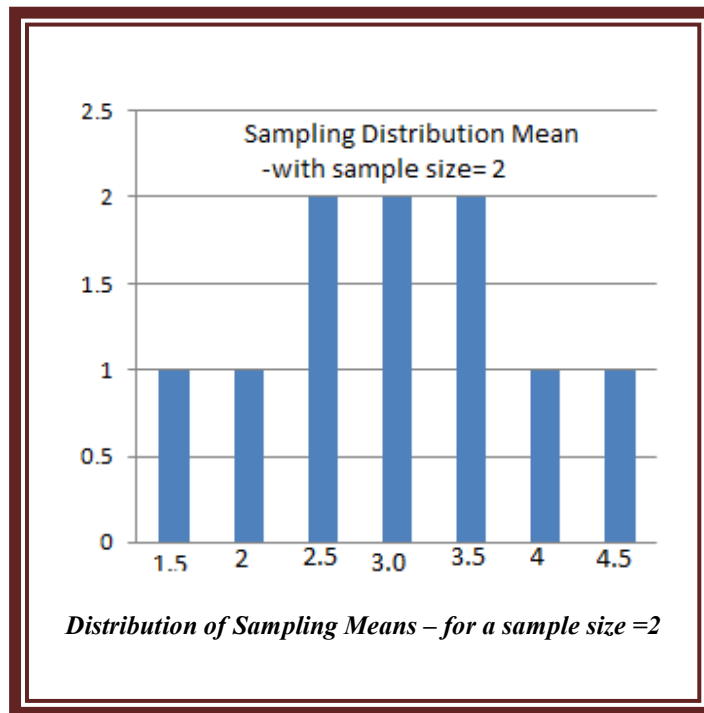
Let us assume that you have taken sample sizes of 2, 3 and 4.

Sample Size -2 units

For the sample size of 2, you know that a maximum of 10 possible unique samples can be selected [$5C2 = 5 \times 4 / 1 \times 2 = 10$]. If you look at a glance of this distribution of sampling means, it is varying from 1.5 to 4.5.

S.No	Sample Elements	Mean of the sample
1	1,2	1.5
2	1,3	2
3	1,4	2.5
4	1,5	3
5	2,3	2.5
6	2,4	3
7	2,5	3.5
8	3,4	3.5
9	3,5	4
10	4,5	4.5

Distribution of Sampling Means – for a sample size =2

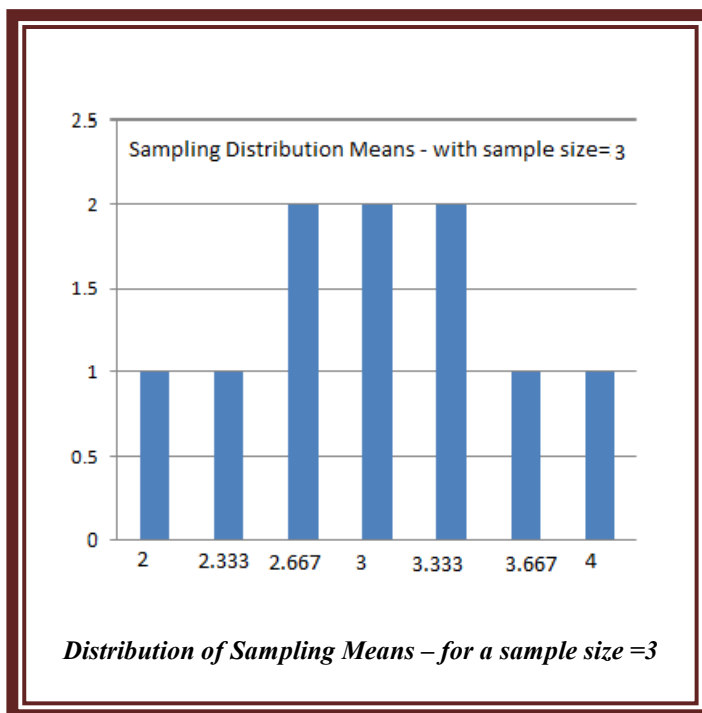


Sample Size of 3

A maximum of 10 possible unique samples can be selected [${}^5C_3 = (5 \times 4 \times 3) / (1 \times 2 \times 3) = 10$]. If you look at a glance of this distribution of sampling means, it is varying from 2.0 to 4.0

S.No	Sample Elements	Mean of the sample
1	1,2,3	2.000
2	1,2,4	2.333
3	1,2,5	2.667
4	1,3,4	2.667
5	1,3,5	3.000
6	1,4,5	3.333
7	2,3,4	3.000
8	2,3,5	3.333
9	2,4,5	3.667
10	3,4,5	4.000

Distribution of Sampling Means – for a sample size =2

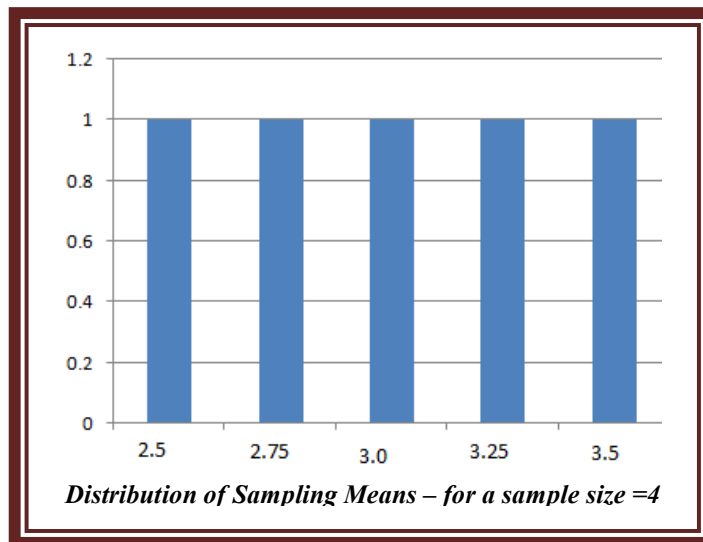


Sample Size of 4

A maximum of 5 possible unique samples can be selected [$5C4 = (5 \times 4 \times 3 \times 2) / (1 \times 2 \times 3 \times 4) = 5$]. If you look at a glance of this distribution of sampling means, it is varying from 2.5 to 3.5.

S.No	Sample Elements	Mean of the sample
1	1,2,3,4	2.5
2	1,2,4,5	3
3	1,3,4,5	3.25
4	1,2,3,5	2.75
5	2,3,4,5	3.5

Distribution of Sampling Means – for a sample size =4



In each case the average of means is equal to 3. Therefore we can say, for a finite population, different sample may or may not have mean equal to population. But the mean of the distribution will be equal to population mean.

The standard deviation of each of these samples represents the distribution of *potential sampling error*, which in statistical terminology is known as *standard error*.

Even though all three samples came from the same population, you would not expect to get the exact same statistic from each. They would differ marginally just due to the random “luck of the draw” or to the natural fluctuations or vagaries of drawing a sample. But you would expect that all three samples would yield a similar statistical estimate because they were drawn from the same population.

Now, if we extend the same logic to an *infinite* number of samples from a population, which consist of 1000s of members. Even for a sample size of 100, [$1000C_{100}$ = you can calculate...] countable samples [of course in millions] can be drawn, which is theoretically possible to do and if we compute the average for each one.

If you plotted them on a histogram or bar graph you should find that most of them converge on the same central value and that you get fewer and fewer samples that have averages farther away up or down from that central value. In other words, the bar graph would be well described

by the bell curve shape that is an indication of a “normal” distribution in statistics. The distribution of an infinite number of samples of the same size as the sample in your study is known as the sampling distribution of means.

Concept of Standard Error

We will now try to understand two important concepts

1. **Standard deviation** is the spread of the scores around the average in a single sample.
2. **Standard error** is the spread of the averages around the average of averages in a sampling distribution.

One can see from the above illustration, when the sample size increases, the range in which the sampling means fall is getting narrow.

Sample size	Range of means
2	1.5 to 4.5
3	2 and 4
4	2.5 to 3.5

It means is Standard Deviation is getting smaller and smaller with increase in the sample size. The Central Limit Theorem tells us that the sampling distribution will be approximately normally distributed provided that the sample size is sufficiently large.

The larger the sample size, the less variability there is in the sampling distribution. When dealing with means, the standard deviation of the sampling distribution is equal to $\frac{\sigma}{\sqrt{n}}$

Concept of Central-Limit Theorem

Another most significant concept in statistical inference is the **central-limit theorem**; it states: As the sample size, n , increases, the distribution of the mean, of a random sample taken from practically any population approaches a normal distribution (with a mean, μ , and a standard deviation, σ/\sqrt{n}). The central-limit theorem works regardless of

the shape of the original population distribution; this is very evident with the illustration, where the population size is taken as 5 [finite one].

Concept of Normal Distribution

Any researcher is expected to have clear knowledge on Normal Distribution. One of the most useful probability distributions in statistics is the **normal distribution** which is also called the normal curve. The normal curve is bell shaped and almost all (99 percent) of its values are within + or - 3 standard deviations from its mean. The **standardized normal distribution** also known as **Standard Normal Distribution** is a specific normal curve that has the following characteristics:

- It is symmetrical about its mean.
- The mean of the normal curve identifies its highest point (the mode) and vertical line about which this curve is symmetrical.
- The normal curve has an infinite number of cases (it is a continuous distribution), and the area under the curve has a probability density equal to 1.0; and
- The standardized normal curve has a mean of zero and a standard deviation of 1.

The standardized normal distribution is a purely theoretical probability distribution, but it is the most useful distribution in inferential statistics.

The computation of the standardized value, Z, is a simple one. All we need to do is subtract the mean from the value to be transformed and divide by the standard error. In the following formula note that σ , the population standard deviation, is utilized as the standard error value and μ is the hypothesized or expected value of the mean:

$$Z = \frac{X - \mu}{\sigma}$$

Concept of Estimation

The objective of any marketing research is to draw inferences about the population – it may be population mean [average number cups of coffee consumed by the people in the district] or population proportion

[percentage of male consumers who consume coffee vs. female consumer consumption per day] or any other characteristics of the population. It is often achieved by taking a sample and draw inference from it. This process is known as estimation.

- Point estimate- If the population characteristics are expressed as a single number, then it is called point estimate. For example, from the sample survey for the marketing researcher for tea/coffee marketing company concludes that average coffee consumption in the district is 5.3 cups per day. Thus, the single number 5.3 describes the population characteristics. Thus, the number / average 5.3 is point estimate for the population mean.
- Interval estimate- On the other hand, if the researcher concludes that the average coffee consumption in the district is likely to be in the interval, say [3.5 cups to 8.5 cups per day], then, we say that we are using interval estimate. Thus, the interval estimate is range of values, within which the population parameter likely to be.

Confidence Level

If you are the researcher, what is the assurance that this interval [3.5 to 8.5] will contain the true population mean? You will definitely not give 100% assurance. So as a researcher, you associate a probability for the interval estimate, that likely to contain the true population mean. This probability is known as confidence level; thus, confidence level is the probability associated with an interval estimate. The interval is known as confidence interval. **The confidence level** is a percentage indicating the long-run probability that the results will be correct. Traditionally, researchers have utilized the 95 percent confidence level.

The confidence interval gives an estimate plus or minus the estimated value of the population parameter:

$$\mu = X \pm \text{a small sampling error (E)},$$

$$\text{Where } E = z_{c.1} \text{ } ^s\bar{x}$$

$z_{c.1}$ = the value of Z, our standardized normal variable at a specified confidence level.

$^s\bar{x}$ = the standard error of the mean.

The following is a step-by-step procedure for calculating confidence intervals:

1. Calculate \bar{X} , the sample mean from the sample taken for the study.
2. Assuming σ , is unknown, [the population standard deviation, which is true in many real life situations] we need to estimate the population standard deviation from the sample deviation, say S.
3. Estimate the standard error of the mean, utilizing the following formula: $S_{\bar{X}} = S/\sqrt{n}$
4. Determine the Z values associated with the confidence level desired. The confidence level should be divided by two to determine what percentage of the area under the curve must be included on each side of the mean.
5. Calculate your confidence interval.

Chebyshev's Theorem-Confidence interval

Whenever we have a normal or bell-shaped distribution, start with the average — the centre of the distribution, and go up and down (i.e., left and right) , that is, take mean plus standard deviations, to predict where the population parameter should be.

mean \pm one standard deviations ($X \pm 1\sigma$)	mean \pm two standard deviations ($X \pm 2\sigma$)	mean \pm three standard deviations ($X \pm 3\sigma$)
68%	95%	99%

If you take, one sigma interval, it will contain at least 68%, for 2 sigma level 95 per cent, for 3 sigma level, will contain at least 99per cent of the original cases / numbers; in the graphical plane. The area under the curve will be 68%,95% and 99% . Now, we try to link all these points together and create inference; if we had a sampling distribution, we would be able to predict the 68, 95 and 99% confidence intervals for where the population parameter should be!

Determining Sample Size

Let us assume that we are interested to find the sample size based on average / sample mean. Three factors are required to specify sample size:

Standard Deviation of the Population

It is the first necessary bit of information. In statistical terms this refers to the standard deviation of the population parameter.

Ideally, similar studies conducted in the past will be used as a basis for judging the standard deviation. In practice, researchers without prior information conduct a pilot study for the purpose of estimating population parameters so that another, larger sample, with the appropriate sample size, may be drawn. This procedure is called sequential sampling, because the researcher takes an initial look at the pilot study results before deciding on a larger sample providing more precise information. A rule of thumb for estimating the value of the standard deviation is to expect it to be one-sixth of the range.

Standard Error

It is the second necessary bit of information. Defined in statistical terms as E, the magnitude of error indicates how precise the estimate must be. From a managerial perspective, the importance of the decision in terms of profitability will influence the researcher's specifications of the range of error.

Confidence Level

We will typically use the 95 percent confidence level. This, however, is an arbitrary decision based on convention.

For the moment, let us assume that the standard deviation has been estimated in some preliminary work. If our concern is to estimate the mean of a particular population, the formula for sample size is $n = (ZS/E)^2$ where

Z = standardization value indicating confidence level

S = sample standard deviation or estimate of the population standard deviation

E = acceptable magnitude of error, plus or minus error factor (range is one-half of total confidence interval).

Correction Factor

In most cases, the size of the population does not have a major effect on the sample size. However, a finite correction factor may be needed to adjust the sample size if that size is more than five percent of a finite population. If the sample is large relative to the population, the above procedures may overestimate sample size, and there may be a need to adjust sample size.

Example

Suppose you are planning a sample of pet dog owners to determine the monthly average number of cans of dog food purchased. The following standards have been set: a confidence level of 99 percent and an error of less than five units. Past research has indicated the standard deviation should be six units. What would be the required sample size?

We know that the sample size estimation equation,

$$n = \left(\frac{ZS}{E} \right)^2 \text{----- (1)}$$

Error limit, $E = 5$

Population standard deviation, which is estimated from the past records,

$$S = 6$$

The required confidence level = 99%, for which the Z-score [standard normal score for 0.495 area of the one side of the normal curve – 49.5% area]

$Z = 2.57$ at 99% confidence

$$n = \left[\frac{(2.57)(6)}{5} \right]^2 = \left[\frac{15.42}{5} \right]^2 = [3.084]^2 = 9.5$$

$$n = 9.5$$

The students should be asked why sample size is so low if the confidence level is at 99%. Of course, it is because such a large magnitude of error is tolerable. You can check up that if you reduce the E to 1 resulting in increasing the sample size to 238.

$$n = \left[\frac{(2.57)(6)}{1} \right]^2 = \left[\frac{15.42}{1} \right]^2 = 237.7$$

Non-Response Adjustment Strategies

The marketing researcher often shall face the issue of non-responses while collecting data. The reasons could be – non-availability of the information with the researcher [*the toilet soap brand you have used while you went for a picnic with your family members*], unimportance of the event to the researcher [*what was the dinner you had last night? A week ago?*], issues related to memory [*what was tax amount you have paid 5 years ago?*] and many more to list. Thus, the researcher has to decide a plan of action while analyzing these missing information / non-responses.

Non-respondents differ from respondents on demographic, psychographic, personality, attitudinal, motivational, and behavioural dimensions. If non-respondents differ significantly on key characteristics of the study, the results will be biased. Increasing the response rate, though not a perfect indicator, is likely to decrease the probability of non-response error.

There are seven methods used to adjust for non-response as given in Table.

(A) Sample Redesign

Sub - Sampling Non-Respondents

From the list of non-respondents, take a sample and find their responses.

Pros Results in a high response rate within the subsample.
Generalizability to the subsample is high.
Can estimate the effect of non-response on the characteristic of interest.

Cons The cost is the highest of all the methods.
You need additional time to carry out data collection activity.

Replacement

In place of non-respondents, the researcher contacts non-respondents from an earlier survey, which is similar to this.

Pros Generalizability to the subsample is high.
Cost is lower than sub-sampling

Cons Care must be taken to ensure that the non-respondent samples are similar

Substitution

Persons of similar characteristics in the sampling frame are contacted to substitute.

Pros Generalizability to the subsample is high
Cost is lower than sub-sampling.

Cons Care must be taken to ensure that the subgroups are internally homogeneous with respect to the respondent characteristics, but heterogeneous with respect to response rates.

(B) Data Manipulation

Subjective Estimates

Based on some priori information, make an estimate of the effect of non respondents.

Pros Cost is minimal. Little additional data is needed

Cons Error in estimation is likely

Trend Analysis

The responses for survey are grouped as earlier, early and later and then compared for a trend in findings. The trend is applied to the non respondents.

Pros Cost is minimal. All data needed is already provided

Cons Not a precise method

Simple Weighting

Assign weights to adjust data. For example, in a survey there are two income classes – high and low and the response rates are 70% and

80%. Assign weights inversely proportional to their response rates i.e., 1000/70 and 100/80 to the sub groups respectively.

Pros Cost is minimal. All data needed is already provided. Can correct for the differential effects of nonresponse

Cons Destroys the self-weighting nature of sampling design. Not a precise method

Imputation

Find demographics common to the non respondents and respondents. Use the data of respondents, who have similar characteristics the non respondents.

Pros Cost is minimal. All data is already provided

Cons Limited use if an entire subsample does not respond

Internet and Computers Assist in Sample Size Determination

The Internet has information available on calculating sample size or determining the margin of error for a given sample size. Discovery Research Group has a sample size calculator that can be found at www.drgutah.com

Use of the Internet itself is thought to increase response rates to surveys because surveys on the Internet are easy to access and can be completed in multiple sessions if necessary. For electronic mail surveys, prior e-mails, sent by the sponsor to announce the survey, are strongly suggested by many of the Internet marketing research firms. These firms also send reminder e-mails to non-respondents a few days after the initial survey has been sent. Another way to motivate respondents to complete surveys is to tell them if the results will be used to enhance service. Another motivator is to provide incentives for completion of surveys.

Microcomputers and mainframes can determine the sample size for various sampling techniques. For simple applications, appropriate sample size formulas can be entered using spreadsheet programs.

- Standard Error by Bardsley & Haslacher, Inc., uses spreadsheets to calculate mean standard errors and 95 percent confidence intervals and can be used for computing sample sizes.
- Statchek by Detail Technologies, Inc., calculates confidence intervals and can be used to determine sample sizes. Survey Sampling, Inc., has a line of sampling products. Their Contact and Cooperation Rate Adjustment software statistically adjusts sample sizes by taking into account the expected incidence and completion rates.

Summary

This chapter introduced various concepts related to sample size determination; most importantly, a discussion on sampling distribution of means and significance of central limit theorem and a formula for sample size determination

Discussion Question

Researchers prefer small samples as they are easy to administer and economical. Accuracy demands large samples. How do you reconcile the conflicting interests?

Mini-project

Visit a local marketing research firm. Find out how the sample sizes were determined in some recent surveys or experiments. Write a report about your findings.

Self Assessment Questions

1. What is sampling error? How can it be reduced?
2. How does sample size influence the estimate of population mean?
3. What is normal distribution? What are its characteristics?
4. What is central limit theorem? What is confidence level?
5. Discuss the relative advantages and disadvantages of the confidence interval approach to sample size determination.
6. Based on the following information set sample size. Confidence

level =95% Standard error =4 units. Past research has indicated the standard deviation should be 3 units. What would be the required sample size?

7. Explain the problem of non-response in sampling.
8. Describe the advantages and disadvantages of methods used to adjust for non-response
9. Explain how internet influences sample size?
10. Explain : population, sample and sampling frame
11. Explain the reasons for choosing to study population
12. Explain the reasons for studying based on sampling.
13. Explain the relationship between the sample and population
14. Explain the concept of probability sampling and list the major types.
15. Distinguish non-probability with probability sampling
16. Discuss the advantages of convenience samples and when it is appropriate to use them.
17. Discuss the advantages of systematic sampling.
18. When is it meaningful to sample potential respondents who are surfing the Internet?
19. Explain : (i) Judgment sampling (ii) Snow ball sampling
20. What are the methods of getting internet samples?
21. What are the limitations of internet sampling?
22. What factors determine sampling method selection?

CASE STUDY

Sampling in Swamimalai and Tanjore Clusters

Mr. Sriraman, a researcher, is conducting a study about Tanjore Art plate cluster and Swamimalai Bronze Icon clusters of Tamil Nadu, India. The study aims to understand the significance of 'micro credit' in development of small-scale sector; particularly, the role of banks and preparedness level of the manufacturers to avail such facilities. In India, many such 'industrial clusters' are existing; places like Moradabad, Nachiar

Koil manufacturing various such products. However, both Swamimalai and Tanjore Art plate clusters got recognition from the Government of India for 'Geographical Identification' (similar to patent). Swamimalai is having nearly 500 artisans and Tanjore Art plate cluster is having about 400 artisans.

Out of these numbers, some of them are doing business through the respective co-operative societies (where the respective artisans get their raw materials, working capital credit and finished products are given to the society; in turn, the society sells the products through its own sales outlets or supplied to the order(s) accumulated by the society) and some of them have their own arrangements to produce and sell. Nearly 175 artisans of Swamimalai and 172 artisans of Tanjore registered with their respective societies. In addition, as an initiative from the State Government of Tamil Nadu, many of the artisans formed their own 'Self-Help Groups' (SHGs). By this initiative, an artisan may be a member of any one of the self-help group. However, not all the artisans joined members of the self-help-groups. Artisans doing business privately and member of the societies together also joined and formed self-help groups. However, the main purpose is to obtain credit for various reasons and some of the artisans use it for their operations also. However, the SHGs are not focusing on any trading activities of the finished products.

Normally a self-help group consists of 10 members, and 30 such groups are formed in Swamimalai and 25 such groups are in Tanjore. In addition, not all the artisans are having their own manufacturing and marketing arrangements. Nearly 1/3 of them are employed with other artisan's workshop on wage basis. Some of the labor-artisans are members of self-help groups and members of the society. The employer may be an artisan who deals through the society (member of the society) or may be a non-member (independent artisans).

Mr. Sriraman is in the process of conducting a survey / interview with the artisans; what kind of suitable sampling plan would be more appropriate for his study?

UNIT-III

Unit Structure

Lesson-3.1 : Measurement Process

Lesson-3.2: Sources of Variations in Measuremen

Lesson-3.3: Scaling Types

Lesson-3.4: Attitude Measurement and Scaling Procedure

Lesson 3.1 - Measurement Process

Learning Objectives

- To discuss various concepts related to Measurement
- To elaborate the process of Measurement

Introduction

This chapter aims to bring out the basics of measurement. In marketing research, you have to measure various characteristics of the consumers / firms. A depth understanding of these concepts will help us to structure our research in better manner.

Nature of Measurement

Sometimes, the information needed for our research may be quite simple and easy to get it.

If we are conducting a study for theme park in the city, we need answers to following questions. whether more male consumers are visiting or female visitors are more? What is the age profile of the visitors? How much time an average visitor spends in the theme park? What factors determine the satisfaction of the visitors? How loyalty status groomed? What are the drivers of loyalty?

So we will define measurement as;

Measurement is defined as determining the amount or intensity of some characteristic of interest to the researcher. A measurable characteristic is called a property.

Measurement property, in general may be viewed as subjective and objective properties.

Objective properties are physically verifiable characteristics such as age, income, number of bottles purchased, store last visited, and so on. For example, we conduct a study on Laundry detergent. Some of the obvious but non-functional properties we might measure are weight, volume, texture, color, odor, cost, etc. Functional properties might include dirt-removing power, effect on colors, speed of cleaning action, and skin irritation power.

Subjective properties are those which cannot be directly observed because they are largely influenced by a person's judgments or impressions. A study to conduct job satisfaction among the employees, we may seek to measure attitudes toward work, attitudes toward the job environment, perceptions of fair treatment and compensation, and absenteeism.

In this case, the marketing researcher must ask a respondent to translate his or her feelings onto a continuum of intensity.

Observed Rules

Measurement means assigning numbers or other symbols to characteristics of objects according to certain pre-specified rules.

Assigning Numbers

What is measured is not the object, but some characteristic of it. Thus, we do not measure consumers - only their perceptions, attitudes, preferences, or other relevant characteristics. In marketing research, numbers are usually assigned for one of two reasons. First, numbers permit statistical analysis of the resulting data. Second, numbers facilitate the communication of measurement rules and results.

Rules

The most important aspect of measurement is the specification of rules for assigning numbers to the characteristics. There must be one-to-one correspondence between the numbers and the characteristics being measured. The rules for assigning numbers should be standardized and applied uniformly. They must not change over objects or time.

Scaling

Scaling is an extension of measurement where it involves the generation of a continuum upon which measured objects are located. Consider a scale from 1 to 100 for locating consumers according to the characteristic “attitude toward department stores.” Each respondent is assigned a number from 1 to 100 indicating the degree of (un) favourableness, with 1 = extremely unfavourable, and 100 = extremely favourable.

Scaling’ is the process of developing a continuum with respect to attitude toward department stores. ‘Measurement’ is the actual assignment of a number from 1 to 100 to each respondent on the scale.

Measurement Utility

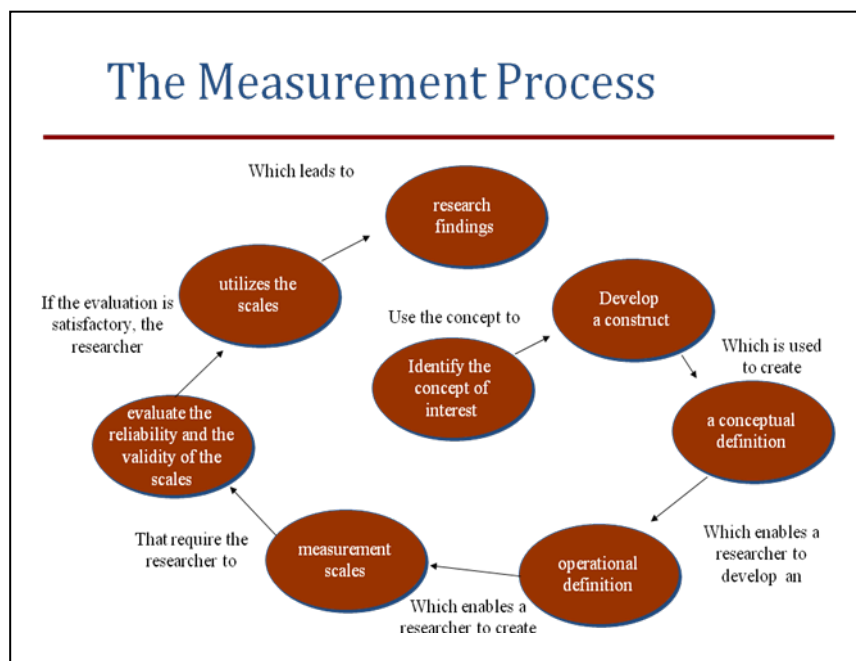
Any researcher need to understand the purpose of measurement; this will help you to decide how to structure your study, analyse the data and interpret the findings and draw conclusion about the variable (s).

Measurement Process

The measurement process is depicted in Figure, will give a step by step activity to be taken by the marketing researcher. We will explain this with a brief marketing research example; Let us assume, we are interested to study the ‘store customer experience’.

Step-1 : Concept of Interest

The step of any measurement process begins with concept of interest we are interested to study. The concept is based on the identification of



an appropriate research objective. It will guide to fix the concepts very closely.

Let us consider the store management is interested to know what makes customers buy repeatedly from the store.

- Measurement begins by identifying a concept of interest for study.
- A concept is an abstract idea generalized from particular facts.

Step-2 Develop a Construct

Once, the concept to be studied is identified researcher has to develop an accurate and elaborate comprehension of the target construct and needed theoretical background and supportive factors. The value of specific constructs depends on how useful they are in explaining, predicting, and controlling phenomena.

In the current example, the concept – loyalty is a ‘function’ of various factors like atmospherics, store personal, complaint handling behaviour, variety, merchandising, location and many more to list. Each such factor is considered as a construct

Step-3 Conceptual Definitions

Once, we identify the constructs, to understand them better, one need how it is conceptually / theoretically defined. For the marketing researcher to define the constructs in unambiguous terms, useful general principles are:

- Provide clear, concise conceptual definition of the construct
- Should not be subject to multiple interpretations – it should convey the same meaning to everyone.
- Should not be overly technical (technical terms with narrow meanings)
- Should define construct positively, not by the denial of other things; negation of one thing does not imply the affirmation of something else
- Should not be circular or tautological or self-referential

An attempt to define loyalty should be made in descriptive as well as measurable ways. It can be found that loyalty is function of store image, commitment of consumers, satisfaction in goods purchased from store etc.

Step-4 Operational Definition

The next state of measurement is evolving an operational definition for the constructs identified. In many occasion, the marketing researcher cannot make use of the construct originally defined in theoretical manner. We need to identify the various observable characteristics of the construct chosen. For example, in spite of many definitions for a store image, which is a dimension of store loyalty, one can consider the following definition for store-image.

Store image has generally been defined as the way in which the store is defined in the shopper's mind, partly by the functional qualities and partly by psychological attributes.

This definition provides the domain of operation of the store image construct. This will give a clear perspective of focus area for construct operationalization.

Step-5 Measurement Scales

The next step involves identifying the appropriate scales to measure the constructs involved in the study. The most common reason for developing scaling is for scoring purposes. When a participant gives their responses to a set of items, we often would like to assign a single number that represents - that is the person's overall attitude or belief.

A scale that is developed for marketing research purpose may have any number of dimensions within it.

If we want to measure a construct, we have to decide whether the construct can be measured well with one number line or whether it may need more.

For instance, height / weight are concepts that are unidimensional or one-dimensional. We can measure the concept of height very well with only a single number line. Weight is also unidimensional; we can measure it with a scale.

But the construct considered in the above example- store image; if you think you can measure a person's store image with a single ruler that goes from low to high, then you probably have a unidimensional construct. However, this is not the case with complex constructs like store-image. It is a multidimensional construct that includes quality of merchandise, variety and assortment of merchandise, layout of the store, and credit and billing policies.

Step-6 Reliability and Validity

The next crucial and little bit technical exercise is assessment of the reliability and validity of the instrument developed for the marketing research product.

- Reliability: Is the degree to which measures are free from random error and, therefore, provide consistent data.
- Validity: Validity addresses the issue of whether what we try to measure was actually measured.

Some multi-item scales include several sets of items designed to measure different aspects of a multidimensional construct. For example, a scale designed to measure store image would contain items measuring many dimensions. So two questions are relevant.

Whether the statements developed to measure a dimension like image are valid?

Whether the entire set of statements is reliable in measuring image of stores?

Summary

Any researcher needs to understand the meaning of level of measurement; this understanding has significant influence on how to structure your study, analyse the data and interpret the findings and draw conclusion about the variable. This chapter introduced various concepts and the process of measurement

Discussion Question

Measurement involves assigning values to both subjective and objective factors. While objective factors are quantifiable, subjective ones are not. Is researcher, making a mistake of measuring what cannot be measured? Discuss.

Mini-Project

Refer to ten research articles and examine how the measurement is done in them. (look for concept, constructs, definitions and measurement)

Lesson 3.2 - Sources of Variations In Measurement

Learning Objectives

- To discuss various sources of variations in Measurement
- To explain the concepts of validity and reliability

Introduction

In research we hope that any measurement represents a true portrayal of the property being measured, but we recognize that it often does not. Errors can be of either a random or systematic type, but it is the latter which represent the greater threat to the measurement process.

Sources of Variations

Measurement is neither simple nor an easy task. Different types of error may creep into the study of a researcher.

Random Error

Random error is caused by any factors that are uncontrollable and unpredictable; this will affect measurement of the variables considered for the research.

For example, in an experimental design, few respondents may be feeling better about the arrangement and will be in a good mood and others may be disappointed with few arrangements and got frustrated. If mood affects their responses on the measure, it may artificially inflate the observed scores for few respondents and artificially deflate them for others.

The important thing about random error is that it does not have any consistent effects across the entire sample; but it pushes observed scores up or down randomly. The most welcoming situation could be, if all of the random errors in a distribution would have to sum to zero; there would be as many negative errors as positive ones.

Systematic Error

Systematic error is caused by any factors that systematically affect measurement of the variable across the sample. Unlike the random sampling error, systematic errors tend to be consistently either positive or negative; thus, the systematic error is sometimes considered to be bias in measurement. The sources of systematic error are many- respondent, (ii) some factors in the communication situation, (iii) researcher, (iv) the instrument being used.

- **Respondent** - Assume, for example, that we are interviewing persons about salary and other related information and include a question about their annual income. The respondents themselves may be a source of error for they may not actually think of every source of income that is included in the research definition. Respondents may also bias results if they tend to exaggerate or understate.
- **Situation** - The situation under which the interview takes place may distort the measurement, especially if the study is being done in the presence of someone else, even a family member. Other situational biases arise if the interview conditions do not foster carefully reasoned answers or provide access to records. The interviewer can affect results, if he/she fails to achieve rapport with the respondent and therefore appears as a threat.
- **Researcher** - Careless recording, coding, and tabulating are other sources of researcher error.
- **Instrument** - Finally, the measurement instrument itself can be an error source. The question may confuse the respondent or be phrased in a way to lead to one answer more than another. The question may, in addition, just not cover all of the possible information needs .

Measures to Reduce Measurement Error

The following measures help reduce measurement errors.

- **Pilot test** the marketing research instruments; that is the process of obtaining feedback from a field study from about 25-50 respondents about how easy or hard the measures; also, you can

collect information about how the testing environment affected their performance.

- ***Train field force*** - if you are gathering data using people to collect the data (as interviewers or observers), you may make sure that you train them thoroughly so that they are not inadvertently introducing error.
- ***Cross check the data***. All data entry for computer analysis should be “double-punched” and verified or at least random verification of a sample portion. This means that either you have to enter the data twice, which is a costly affair; or you can take randomly few response sheets [questionnaires] and check the accuracy of data entry.
- ***Use appropriate statistical procedures***, which can take care of measurement errors. The statistical procedures are ranging from simple formulas you can apply directly to your data to very complex modelling procedures [procedures like SEM / LISREL], for modelling the error and its effects.
- ***Use multiple measures of the same construct***; however there is a danger of respondents losing interest.

But no one can assure which procedure will work better; in many studies, the researchers could employ the pilot testing and incorporating the suggestions from field – which is practiced more often than other methods.

Criteria used to Evaluate a Multi-Item Scale

Data are collected on the reduced set of potential scale items from a large pretest sample of respondents. The data are analyzed using techniques such as correlations, factor analysis, cluster analysis, discriminant analysis, and statistical tests. As a result of these statistical analyses, several more items are eliminated, resulting in a purified scale. The purified scale is evaluated for reliability and validity by collecting more data from a different sample. On the basis of these assessments, a final set of scale items is selected.

Measurement accuracy: It refers to capturing the responses as the respondent intended them to be understood. Errors can result from either

systematic error, which affects the observed score in the same way on every measurement, or random error, which varies with every measurement.

Reliability: Refers to the extent to which a scale produces consistent results if repeated measurements are made on the characteristic. Thus, the scale is free from random error.

Validity: Refers to the accuracy of measurement. Validity of a scale may be defined as the extent to which differences in observed scale scores reflect true differences among objects on the characteristic being measured, rather than systematic or random errors.

Generalizability: Refers to the extent to which one can generalize from the observations at hand to the set of all conditions of measurement over which the investigator wishes to generalize, called the universe of generalization.

Validity of Measurement

Researcher must first distinguish the types of validity: Content, criterion and construct.

Content validity

In *content validity*, the researcher has to evaluate the operationalization against the relevant content domain for the construct he developed. In this approach we start with an assumption that we have a detailed description of the content domain.

For instance, we might lay out all of the criteria that should be considered for 'customer's shopping experience'. However, we would include in this domain specification, the definition of the target group, criteria for deciding experience in shopping context, and lots of criteria that spell out the content that should be included like basic information, music, atmospherics, staff, amenities, complaint handling, and so on.

Then, with the help of these criteria, we could use them as a type of checklist when examining 'What is Customer Experience'. Those points / factors, which meet the criteria, can legitimately be defined as "Components / Factors affecting Customer Experience".

This all sounds fairly straightforward, and for many operationalizations it will be. But for other constructs (e.g., self-esteem, intelligence), it will not be easy to decide on the criteria that constitute the content domain.

Criterion-Related Validity

In criterion-related validity, you check the performance of your operationalization against some criterion. The differences among the different criterion-related validity types are in the criteria they use as the standard for judgment.

Thus, it is a comparative study of the chosen measurement scale's performance in relation to other variables selected as meaningful is conducted. This can be either concurrent or predictive.

Predictive Validity

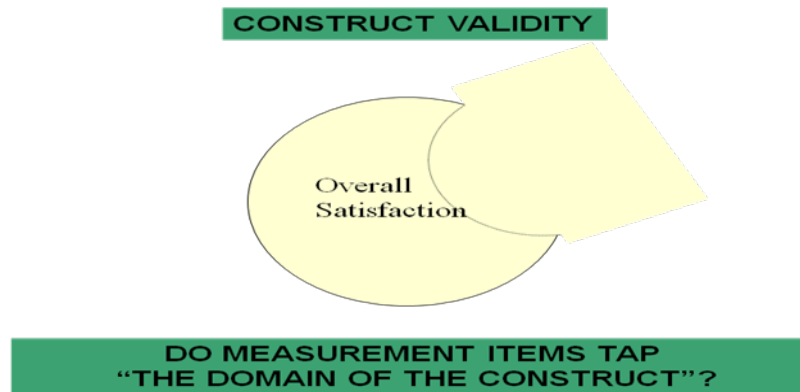
In predictive validity, we assess the operationalization's ability to predict something it should theoretically be able to predict. For instance, we might theorize that a measure of mathematical ability should be able to predict how well a person will do in an engineering-based profession. We could give our measure to experienced engineers and see if there is a high correlation between scores on the measure and their salaries as engineers. A high correlation would provide evidence for predictive validity -- it would show that our measure can correctly predict something that we theoretically thing it should be able to predict.

Concurrent Validity

In concurrent validity, we assess the operationalization's ability to distinguish between groups that it should theoretically be able to distinguish between. For example, if we come up with a way of assessing manic-depression, our measure should be able to distinguish between people who are diagnosed manic-depression and those diagnosed paranoid schizophrenic. If we want to assess the concurrent validity of a new measure of empowerment, we might give the measure to both migrant farm workers and to the farm owners, theorizing that our measure should show that the farm owners are higher in empowerment. As in any

discriminating test, the results are more powerful if you are able to show that you can discriminate between two groups that are very similar.

Construct Validity



Construct validity involves two parts, which should be answered, viz., “land of theory” and the “land of observation.”

- The land of theory is what goes on inside to the researcher’s comprehension and mind, and his/her attempt to describing the same to others. It is all of the ideas, theories, hunches and hypotheses that you have about the world. In the land of theory you will find your idea of the program or treatment as it should be.
- The land of observation consists of what you see happening in the world around you and the public manifestations of that world. In the land of observation as a researcher, you will find your actual method and your actual measures or observational procedures. You have constructed the land of observation based on your theories. You developed the program to reflect the kind of program you had in mind. You created the measures to get at what you wanted to get at.

Thus, you can view construct validity as an assessment of how well you have translated your ideas or theories into actual programs or measures. It is very essential, because when you think about the respondents, or talk about it with others (land of theory) you are using words that represent concepts.

For example, if you tell someone that a special type of accounting method will help the MBA students to do better in accounting related papers, you are communicating at the level of concepts or constructs.

Here, you have not described in specific terms, various processes involved or how you are going to operationalized everything. Here, we are talking in general terms, using constructs.

If you based your recommendation on research that showed that the special type of coaching improved the student's accounting paper scores, you would want to be sure that the type of coaching you are referring to is the same as what that study implemented and that the type of outcome referred by you, should occur. Otherwise, you would be mislabelling or misrepresenting the research. In this sense, construct validity can be viewed as a "truth in labelling" kind of issue.

Construct validity

includes convergent, discriminant, and nomological validity.

Convergent Validity

Convergent validity examines the extent to which the scale correlates positively with other measures of the same construct. Thus, one would correlate the data from the scale with other scales constructed to measure the construct; if positive correlations were found, convergent validity is established.

Thus, in convergent validity, the researcher has to examine the degree to which the operationalization is similar to (converges on) other operationalizations that it theoretically should be similar to. For instance, to show the convergent validity of a Pilgrims' Experience Management for TTD Temple Context, we might gather supportive evidences, which show that the instrument is similar to other temple contexts. Or, to show the convergent validity of a test of an item in a dimension / factor of experience management, we might correlate the scores on items with scores on other items that purport to measure a particular factor of 'Experience Management', where high correlations would be evidence of convergent validity.

Discriminant Validity

Discriminant validity indicates the extent to which a measure does not correlate with other constructs from which it is supposed to differ. It involves demonstrating a lack of correlation among differing constructs. Thus, the scale would be used to measure other constructs from which it should theoretically differ; if negative correlations result, discriminant validity is established.

Thus, in *discriminant validity*, the researcher has to examine the degree to which the operationalization is not similar to (diverges from) other operationalizations that it theoretically should be not be similar to. For instance, to show the discriminant validity of a 'Experience from Atmospherics', we might gather evidence that shows that the 'Experience from Atmospherics' is *not* similar to other construct of 'Experience', say, for instance, 'Experience from Connectivity' or 'Experience from Information Component'.

That is we have to prove that the discriminant validity of an 'Experience from Atmospherics' construct, we might correlate the scores on 'Experience from Connectivity' or 'Experience from Information Component', where low correlations would be evidence of discriminant validity.

Nomological validity

Nomological validity examines the extent to which the construct correlates in theoretically predicted ways with measures of different but related constructs. A theoretical model is formulated that leads to further deductions, tests, and inferences. Gradually, a nomological net is built in which several constructs are systematically interrelated. Thus, the scale would be incorporated into a nomological network to test its correlations with other constructs; if the resulting correlations appear in theoretically predicted way, nomological validity is established.

Reliability Measurement

In research, the term reliability means "repeatability" or "consistency". A measure is considered reliable if it would give us the same result over and over again.

Cronbach's alpha has traditionally been used to estimate the internal consistency / reliability of the measures. Generally speaking, the accepted standard for both of these indices is 0.70 or above for newly developed measures (Nunnally and Bernstein 1994).

However, it is widely known that alpha increases as the number of measures increases, so a higher value may be appropriate in cases where the number of measures is large (Cortina 1993) .

The coefficient alpha, or Cronbach's alpha, is the average of all possible split-half coefficients resulting from different ways of splitting the scale items. This coefficient varies from 0 to 1, and a value of 0.6 or less generally indicates unsatisfactory internal consistency reliability.

An important property of coefficient alpha is that its value tends to increase with an increase in the number of scale items. Therefore, coefficient alpha may be artificially, and inappropriately, inflated by including several redundant scale items.

The relationship between reliability and validity can be understood in terms of the true score model. If a measure is perfectly valid, it is also perfectly reliable. If a measure is perfectly reliable, it may or may not be perfectly valid as systematic error may still be present. The lack of reliability constitutes negative evidence for validity. Reliability is a necessary, but not a sufficient, condition for validity.

The major differences between the two are that test-retest reliability administers the same scale two different times and measures the correlation between the results. Alternative-forms reliability uses two equivalent forms of a scale for the two tests

The internal consistency reliability approach can be applied to assess the reliability of a summated scale where several items are summed to form a total score. Each item can be considered to measure the marketing construct in question and the items should be consistent in what they indicate about the construct.

Summary

This chapter introduces various sources of variations in measurement listed out criteria used to evaluate multi-item scales and provide a detailed discussion on issues such as validity and reliability.

Discussion Question

Two academic researchers create a psychographic scale to measure attitudes toward downsizing/rightsizing. They do not evaluate the reliability or validity of the measuring instrument. They submit the article about their research to a scholarly publication for review. Is this ethical? Discuss.

Mini-Project

Collect two research papers that have used questionnaire for data collection. Examine how their validity and reliability are determined and prepare a note.

Lesson 3.3 - Scaling Types

Learning Objectives

- To elaborate various level of measurement available for the marketing researchers
- To discuss the advantages and disadvantages of various scaling approaches

An introduction

Any researcher has the opportunity to select a measuring system. Unfortunately, many measurement scales used in business research are not directly comparable. The first question the researcher must ask is “What is to be measured?” This question is not as simple as it first seems. A precise definition of the concept may require a description of how it will be measured, and there is frequently more than one way of measuring a concept. We will now examine the types of scales used in marketing research.

Level of Measurement

Measurement requires a process of precisely assigning scores or numbers to the attributes of people or objects. To have precise measurement we need scales and a system of consistent rules for assigning numbers.

A *scale* may be defined as any series of items that are progressively arranged according to value or magnitude into which an item can be placed according to its quantification. In other words, a scale is a continuous spectrum or series of categories. The purpose of scaling is to represent, usually quantitatively, an item's, a person's, or an event's place in the spectrum.

A *rule* is a guide instructing us what to do. An example of a measurement rule might be “assign the numerals 1 through 7 to individuals

according to how brand loyal they are. If the individual is an extremely brand loyal individual, assign a 1. If the individual is a total brand switcher with no brand loyalty, assign a 7.” Operational definitions help the researcher specify the rules for assigning numbers.

The level of measurement refers to the relationship among the values that are assigned to the attributes of a variable. There is a hierarchy implied in the level of measurement idea. At lower levels of measurement, assumptions tend to be less restrictive and data analyses tend to be less sensitive. As the levels go up, the current level of measurement will include all the characteristics / qualities. There are typically four levels of measurement.

- Nominal scale - codes
- Ordinal scale - ranks
- Interval scale – rating from high to low
- Ratio scale – percentages

Nominal Scale

The lowest measurement level one can use in marketing research projects from a statistical point of view is the nominal scale. This is used only as a labelling scheme where numbers serve only as labels or tags for identifying and classifying objects with a strict one-to-one correspondence between the numbers and the objects. The numbers in a nominal scale do not reflect the amount of a characteristic possessed by the objects; rather they are used only for identification. For example, numbers on baseball players uniforms, street names, or social security numbers.

Please register your education qualification:	<input type="checkbox"/> 1	School Dropout	<input type="checkbox"/> 2	Graduate	<input type="checkbox"/> 3	Professional Degrees
Please register the type of your home town:	Rural	Semi-Urban	Urban			

From the above examples of nominal scales, as the name implies, it is simply placing of some data into categories, without any order or structure.

If you use nominal scales in the research project, the statistical tools, which can be used, are mode, cross tabulation, frequency distribution

and Chi-Square. And in ANOVA, these variables will be useful to create groups.

The scope is widened to use very sophisticated modelling techniques like Logistic Regression, Discriminant Analysis.

Ordinal Scale

Ordinal scales involve the ranking of individuals, attitudes or items, brands and firms based on the selected attribute along the continuum of the characteristic being scaled. Ranks are assigned to objects to indicate the relative extent to which some characteristic is possessed by the individual or firms or brands; that is to determine whether an object /firm/brand has more or less of a specific characteristic than some other object /firm/brand.

Consider the following case. Please rank the following cola brands based on your preference:

S.No	Brand name	Order of preference
1	Pepsi Cola	
2	Coca Cola	
3	Thumps Up	
4	Diet Pepsi	
5	Diet Coke	

The respondent compares all the five brands and determines which is his first choice and assign Rank-1; from the remaining list of 4 brands, he compares them with one another and among the 4 brands, the next preferred will be given a rank of 2 and so on. In this process, the respondents have to make preference ratings for N-1 objects/brands, if the list of consists of N items.

In this process, there is no objective distance between any two brands on your subjective evaluation scale. For you the top most preferred brand may be [say Pepsi cola] far superior to the second preferred cola, say [Diet Pepsi], i.e., given a chance, you would avoid Diet Pepsi; but, to another respondent, say your friend, with the same top and second

preference choices, the distance may be subjectively small. That is, if Pepsi is not available, he would not mind taking Diet Pepsi, if it is available.

Thus, this ordinal scale only lets you interpret overall /gross order or preference and not the relative positional distances; that is, there is no information about the interval between any two brands / teams.

If you use ordinal scales in the research project, the statistical tools, which can be used, are median, mode, quartiles, percentiles, rank correlation and non-parametric tests.

Interval Scale

When the marketing researcher is asking you to rate your perception of sugar content, on a 5 point scale [there are 5 choices – very high-high-normal-low-very low, so the name 5-point scale], the researcher is using an interval scale.

It is an interval scale because it is assumed to have equidistant points between each of the scale elements. That is the distance between very high-high is same as the distance between normal-low. This means that we can interpret differences in the distance along the scale. Numbers are used to rank objects such that numerically equal distances on the scale represent equal distances in the characteristic being measured.

Example.

Q. Based on sugar content, how do you rate the following soft drink brands?
(Put tick mark (✓) against appropriate cell that shows the relevant rating)

Brand Name	Very High	High	Normal	Low	Very Low
Pepsi Cola					
Coca Cola					
Thumps Up					
Diet Pepsi					
Diet Coke					

Thus, in the interval scale there is precise information about the interval between any two brands based on the attribute chose. Hence, in an interval scale, the origin [zero point] is not fixed, but arbitrarily chosen and unit of measurement is also arbitrary. This particular mathematical property, of course has a logical implications for the type of data manipulation and analysis we can carry out on data collected in this form.

For instance, you can add or subtract a constant to all of the scale values without affecting the form of the scale but one cannot multiply or divide the values.

You can say that two respondents with who have rated sugar content in a soft drink as 1 and 2 are as far apart as two respondents with scale positions 4 and 5; but not that a person with score 10 feels twice as strongly as one with score 5.

Another popular example is temperature measurement; Temperature is interval scaled, being measured either in Centigrade or Fahrenheit; we cannot say 50°F being twice as hot as 25°F because, the corresponding temperatures on the centigrade measurement scale will be, 10°C and -3.9°C respectively, which are not in the ratio of 2:1.

Consider another popular measure- an IQ scale; in spite of the fact that the intervals are not necessarily equal (for example, the difference between 100 and 110 is not really the same as between 80 and 90), often, the behavioural scientists are willing to assume that most of their measures are interval scales as this allows the calculation of measures of central tendencies /dispersions like, mode, median and mean, the range and standard deviation.

However, we should note an important characteristic of the interval scale; it contains all the information of a nominal and ordinal scaled data would have given to a marketing researcher; in addition to that, it provides the absolute magnitude of the attribute you consider and an arbitrary zero point.

This is the scale, often employed by the marketing research applications to measure attitudes, opinion, preferences and so on. Since it contains an arbitrary zero too, all the statistical techniques which can be

applied to scales such nominal and ordinal can be used in interval scale measures.

The list of statistical tools related analysing an interval scale ranging from simple mean, median, mode, to inferential statistical tools like correlation, regression to advanced model building techniques like Covariance Analysis [LISREL].

Ratio Scale

This is used to identify or classify objects, rank order the objects, and compare intervals, differences, for example, height, age, and income. This scale contains all the properties such as, assignment, order, distance and origin, thus possess all the properties of nominal, ordinal and interval scales. Moreover, it contains an absolute zero, which makes any measurement more meaningful.

This means that you can construct a meaningful fraction (or ratio) with a ratio variable.

For example, weight is a ratio variable. In many marketing research works, a variable with counting properties – like ‘number of dealers appointed last year’, ‘number cars sold last 12 months’, ‘number of advertisement released to support the product’; because, in all these cases, number of dealers, cars, ads – have a meaningful zero [absolute zero – when someone said zero as response – it conveys the same meaning to everyone] and it is meaningful when we say, - we had twice as many dealers appointed in the last quarter, as we did in the previous quarter before the last quarter.

Q. Number of customers visited your shop last week: _____.

Q. Number of advertised last month to promote the Brand ABC: _____.

In marketing research, however, application ratio scales are very limited; variables like sales of a dealer, cost associated with sales person

expenses per month, number of clients added to the company during a year and so on. Given that sociological and management research contexts, very rarely researchers attempt to go beyond the interval level of measurement; but virtually all the statistical tools can be applied and data can be analysed.

Comparison of Scales

The advantage of a ratio scale over an interval scale is that the origin is fixed. Hence, it is meaningful to take ratios of scale values. Statistics such as the geometric mean, harmonic mean, and coefficient of variation can be applied to analyze ratio scale data. However, this advantage is not significant because the commonly used statistics in marketing research can be calculated on interval data.

In general, the rating scales – interval or ratio scales have an advantage in that they require less time of the respondents – the respondents normally can understand the process very quickly; also, these types of scales are interesting to use, and have a wider range of application than ordinal [ranking] or nominal methods of measurements. They can also be used with a large number of properties or variables.

The major disadvantage of rating scales is that they assume that a person can and will make good judgments. The human element in rating scales makes the scale subject to the common errors of leniency, central tendency, and the halo effect. Ranking scales do not have the wide application of rating scales, nor can they be used with a large number of properties or variables. However, ranking scales permit the respondent to express his/her attitude in an unambiguous manner. Whereas rating scales are generally viewed as interval scaled, ranking scales are ordinal.

Summary

An introduction to most popular four levels of measurement is given at the beginning and later this chapter covered various advantages of a ratio scale over an interval scales

Discussion Question

Different scales are developed to serve different purposes. It is unwise to say one is better and another is not- Discuss.

Mini-Project

Collect 10 research papers having questionnaires. Observe the scales used by researchers and prepare a note on it.

Lesson 3.4 - Attitude Measurement and Scaling Procedure

Learning Objectives

- To know about attitudes and their measurement.
- To introduce a classification scheme – comparative and non-comparative scales
- To explain the construction process of various scales

Introduction

Marketing research often requires the study of consumers, retailers and expert opinions on different aspects like brands, firms and future trends. The data collected from them may be either quantitative or qualitative or both. For obtaining qualitative data that includes attitudes, values and judgments, marketing researchers require scales. Various types of scaling procedures are evolved for the benefit of researchers, which we will discuss in this lesson.

Attitude Measurement

Attitude has been defined as a predisposition to respond to an idea or object. In the marketing domain, this concept relates to the consumer's disposition to respond to a product or service or in particular brands.

Many marketers strongly feel that if this predisposition is favourable or positive, the consumers of the target market is more likely to acquire the product for his personal consumption or purchase for his/her family or sometimes, likely to recommend the brands to his peers/relatives/ friends. However, tracing the 'black box' of the consumer is not an easy task. Attitude composes of three elements:

- **Cognitive component** – Awareness and beliefs such as 'I am aware of the brand'. "The taste of the coffee brand is better', and 'This is the economy brand in the market';

- **Affective component** - Emotional feelings about the object/person/brand/service; 'I like the advertisement', 'I like the taste of the brand', and 'I am happy with the service provided by the hospital'.
- **Behavioural intentions**- Readiness of the individual to respond behaviourally; 'I will buy the brand while making my next shopping trip', 'I will ask my friends to purchase the brand', 'In case of any issues, I will ask the firm to clarify those issues'.

Scaling Procedure

Scaling methods are classified into two types: comparative and non comparative. They help evaluate one brand /product/firm /personality by a respondent.

- **Comparative scaling procedures** - The scales help respondent compare one brand /product/ firm/personality with another brand/product/firm/personality on the selected characteristics or attributes.
- **Non-comparative scaling procedures** - The scales help respondents evaluate a product / brand / firm / personality on the selected attributes or characteristics. Their evaluation is independent of the other product and/or brands.

We will know about the two procedures in detail.

Comparative Scaling Procedures

Comparative rating scales include the following: Rank order scaling, Paired comparison scaling, Dollar metric comparison, constant sum and Q sort scaling.

Rank order scaling - The most popular comparative scaling technique is rank order scaling. In rank order scaling, respondents are presented with several objects simultaneously and asked to order or rank them according to some criterion. If there are n stimulus objects, only $(n - 1)$ scaling decisions need be made in rank order scaling.

Paired comparison scaling - In paired comparison scaling, a respondent is presented with two objects and asked to select one according

to some criterion. However, in paired comparison scaling $[n*(n - 1)/2]$ decisions would be required. For example, based on “maintenance cost” choose the best brands from the given set of Motor Cycles;

	Yamaha	Hero Honda	K.Bajaj	Suzuki
Yamaha	0			
Hero Honda		0		
K.Bajaj			0	
Suzuki				0

Based on the criteria given (maintenance cost) if the brand is superior (lesser cost of maintenance) the respondents can assign the value ‘1’ and otherwise ‘0’

- The sum of the score across the row/column can reveal how many times the brand preferred over other brands.
- Normally the researcher has to include provision for neutral answers; but often is very difficult to comprehend to give a response by the respondents.
- From this we can infer if ‘r’ objects are given, then the respondents has to make $(r * [r-1]) / 2$ decisions; thus, if you want to compare 6-7 brands of cars / bikes directly, this procedure will be very difficult.

Paired comparison scaling is useful when the number of brands is limited because it requires direct comparison of brands. A major disadvantage of paired comparison scaling is that the number of comparisons becomes unwieldy with a large number of brands. Also, violations of the assumption of transitivity may occur, the order in which the objects are presented may bias the results, and they bear little resemblance to the marketplace situation involving multiple alternatives.

For example, 10-15 brands are there, then brand-1 may be better than brand-5; later, brand -5 may be better than brand-13; later brand 13 may be better than brand-5; now the question arises, where brand-1 is better than brand-5 / brand-13 and so on.

Dollar Metric Comparisons - This is an extension of the paired comparison scaling method. The respondents are asked to indicate both their preference and how much they are willing to pay for their preference.

This scaling technique gives the marketing researcher an interval - scaled measurement.

'How much are you willing to pay more for a brand over the other brand?'

	Yamaha	Hero Honda	K.Bajaj	Suzuki
Yamaha	0			
Hero Honda		0		
K.Bajaj			0	
Suzuki				0

The respondents is going to mark Rupee/\$ value in the cells. Then the mean is calculated for each brand.This procedure will be applicable only when limited number of brands/objects is studied.

Constant sum scaling - In a constant sum scale, the respondents are required to allocate a constant sum of units such as points, dollars, chits, stickers, or chips among a set of stimulus objects with respect to some criterion. The constant sum is a more refined ranking scale in that it allows fine discrimination among stimulus objects without requiring too much time.

For example, if the marketing researcher is conducting a study on preference factors for choosing a motor bike. Respondents are asked to assign/allocate a constant sum (say 100 points or 100%) to the set of objects/characteristics of the objects. If some of the attributes are not important, respondents can assign zero. Then the researcher has to find out the average for all the characteristics across the respondents.Even though the scale slightly appeared to be metric, it is considered as ordinal since the points are assigned on comparison of objects/stimulus.

S.No	Characteristics	Points
1.	Drum Type	
2.	Color	
3.	Scratch Resistance body	
4.	Water Consumption	
5.	Power Consumption	
6.	Spares Availability	
	Total	100

The constant sum has an absolute zero position; also, it is very clear that 10 points are twice as many as 5 points, and the difference between 5 and 2 points is the same as the difference between 57 and 54 points. For this reason, constant sum scale data are sometimes treated and behaves as metric scale [ratio /interval].

Although this may be appropriate in the limited context of the stimuli scaled, these results are not generalizable to other stimuli not included in the study. Hence, strictly speaking, the constant sum should be considered an ordinal scale because of its comparative nature and the resulting lack of generalizability.

Q-sort scaling- Q-sort scaling was developed to discriminate among a relatively large number of objects while taking less time than other comparative scaling techniques. This technique uses a rank order procedure in which objects are sorted into piles based on similarity with respect to some criterion. The number of objects to be sorted should not be less than 60 or more than 140—with 60 to 90 objects constituting a reasonable range.

- The number of objects to be placed in a pre-specified pile.
- In analyzing the data, successive integers are assigned to denote the subjective values of the piles.

For example, assume a researcher is conducting a study on various factors that are useful in predicting the brand image of a news paper; from the literature, it is very clear that there are no measurement scales available to study these concepts for a newspaper. So he conducted a series of 'focus group' discussion and identified nearly 125 points are there – which create a kind of hot discussion among the focus group members; to prepare the final scale, the researcher shall make use of Q-Sort procedure. As it will be difficult to study all the 125 items / variables associated; he would like to narrow down to 30 to 50 variables, which will be more relevant.

Here, the research can approach experienced professionals, working in media industry [experts] and ask them to identify the most important to least important among the 125 items and can take further study only based 30-50 items, which are most important.

Non-Comparative Scaling Procedures

Non-comparative scales do not compare the object against another object or some standard. Rather, the rater uses whatever standard seems most appropriate to him or her. The important decisions researcher has to make when constructing non-comparative itemized rating scales are given under.

Number of Scale Categories to use - The number scale categories, can vary from 3 to 11 in research studies. The common one is the 5-point scale. If the respondents are very poor in comprehending the construct, it would be better to use 3-point scales. The information about respondents can be obtained from 'pilot studies'.

Balanced versus Unbalanced Scales - One bias, which is found in many research projects, is 'auspicious bias'. If researcher uses a 5-point scale, out of which 3 or 4 points indicate positive aspect of the attribute as given under, results will be biased. The right approach is to give equal chances for positive and negative ratings.

Wrong Approach

Q: Please register your opinion of taste of the tea brand you are using:

Excellent Very good Good Normal Poor

Correct Approach

Q: Please register your opinion of taste of the tea brand you are using:

Very good Good Neutral Poor Very Poor

Odd or even number of categories - Another important decision is: whether researcher should have odd number of categories or even number of categories in each question. Many marketing researchers use odd number of options, where one neutral position and equal number of positive and negative response options can be allowed. On occasion, it may also be needed to adopt even number rather than odd – to avoid central tendency effect; that is forcing the respondents to register either positive or negative perceptions / responses.

Six point scale:

Excellent Very good Good Poor Very Poor Worst

Forced versus non-forced choice - Some time, the researchers keeps options like ‘don’t know’, ‘neutral’, ‘neither agree nor disagree’ in the response set choices. It allows respondents to avoid answering a question, they may not be interested to give the real response; so to please the researchers, and they use to select the middle one. So the researcher has to decide whether he would give chance for this type of situations.

The nature and degree of the verbal description - The strength of the adjectives used to anchor the scale has a slight tendency to influence the distribution of the responses. With strong anchors, respondents are less likely to use the extreme scale categories. Try to encourage multiple anchors that can be used in the survey.

The physical form of the scale - There is no agreement as to which form is the most appropriate, but scales could be presented vertically or horizontally, categories could be expressed in terms of boxes, discrete lines, or units on a continuum and may or may not have numbers assigned to them, and numerical values could be positive or negative or both. The marketing researchers should decide which format to use for the scales. Have them justify their reasons for the scale they choose.

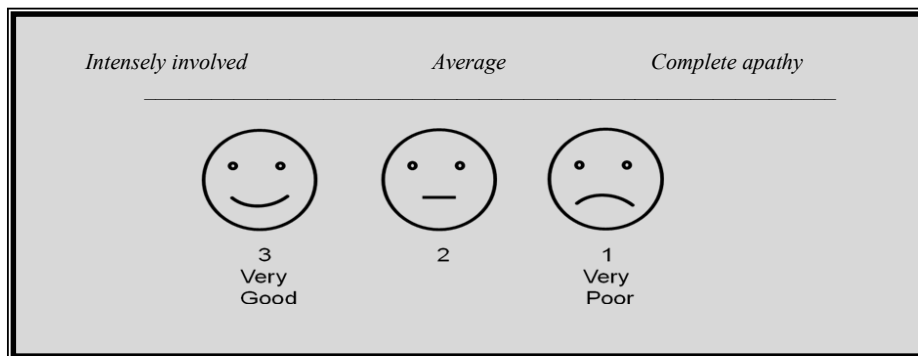
Continuous Rating scale - The respondents rate the objects by placing a mark on an appropriate position on a line that runs from one extreme of the criterion variable to other extreme. In the scales, the line may contain scale points in the form of ‘Numbers’ or ‘Brief Description’. The scale can also be written on card [show cards]/ [profile cards / by the marketing researchers and shown to the respondent during the personal interviews. However, if it online – internet surveys, it will be placed in the questionnaire in a continuous manner.

Q. How do you rate the taste of ABC Brand of Tea? [Place a tick mark in the response form in an appropriate place] –

Form – 1	0	_____	100%
Form – 2	Prob. the worst	0 _____	100 Best
Form – 3	Very bad	0 _____ NG+NB _____	100 V.Good

Graphic Rating Scales - A graphic rating scale presents respondents with a graphic continuum. For example, You may express

your level of involvement as a “/” intersecting the selected point along the line. Sometime, the marketing researcher uses a modified version of ‘Graphic Rating Scale’ using picture / carton faces - stressing Pictorial Visual Communications- which will be useful to overcome monotony set during the data collection process



Monadic Rating Scale - *Instead of getting response for multi-dimensional factors, this scale concentrates on single concept. Thus, the scale asks about a single concept.*

For example,

Q. You have had your automobile for about 1 year; please tell us how satisfied you are with its engine power and pickup.

<i>Completely</i>	<i>Very</i>	<i>Fairly Well</i>	<i>Somewhat</i>	<i>Very</i>
<i>Satisfied</i>	<i>Satisfied</i>	<i>Satisfied</i>	<i>Dissatisfied</i>	<i>Dissatisfied</i>

Itemized Scales – It is a scale, having ‘Numbers’ or ‘Brief Description’ associated with each category. They allow respondents to select one of the limited number of categories, ordered in terms of scale position that best describes the product, brand, company or product attribute being studied.

The categories are ordered in terms of scale positions. The respondents are required to select the specified category that best describes the object. Three popular methods of itemized scales – Likert’s scale, Semantic Differential Scale and Staple scale are briefly discussed below.

Likert’s scale - This type of scale would consist of a series of statements about the concept / construct, each with a 5 point scale (may also be 3 or 7 point) expressing a degree of agreement or disagreement.

Listed below are statements that describe different opinions about Store XYZ. Please indicate how strongly you agree or disagree with each statement by using the following scale:

1 = *Strongly Disagree*

2 = *Disagree*

3 = *Neither Agree nor Disagree*

4 = *Agree*

5 = *Strongly Agree*

I do most of my shopping at store XYZ. 1. Strongly Disagree 2. Disagree 3. Neither Agree 4. Agree 5. Strongly agree

Like in any scale development procedures, the first step is to define the objective of measurement – that is - what it is trying to measure. Since Likert's scaling is a unidimensional scaling method, it is assumed that the concept, the researcher wants to measure is one-dimensional in nature. The respondents are required to indicate a degree of agreement or disagreement with each of a series of statements related to the stimulus objects. The Likert scale is often used in marketing. It is easy to construct and administer, it is easy for respondents to complete, and it is suitable for mail, telephone, and personal surveys.

On some scales, the researchers use to have items that are reversed in meaning from the overall direction of the scale. These are called *reversal items*. The idea is to avoid /overcome the monotonously the respondents choosing the responses. Thus, at the end, the researcher has to reverse the responses obtained for each of these items before summing for the total. That is, if the respondent gave a 1, you need to make it as 5; if they gave a 2 you make it a 4; 3 = 3; 4 = 2; and, 5 = 1.

Merits

Easy to develop - Likert scales are relatively easy to develop compared to differential scales. They are most useful when it is possible to compare the person's score with a distribution of scores from some well defined group.

Easy to use - Since respondents answer each item it is probably more reliable than a differential scale in which only a few items are chosen. Also, it is easy to use this scale both in respondent-centered and stimulus-centered studies.

Respondents readily understand how to use the scale. It is suitable for mail /telephone, or personal interview methods of data collection. It is easy to construct and administer.

Demerits

Time taking- The major disadvantage of the Likert scale is that it takes longer to complete than other itemized rating scales because respondents have to read each statement.

Variety of responses- Another major disadvantage of the Likert scale is that a total score can be secured by a wide variety of answer patterns, thus there are questions as to the meaning of the total score.

Semantic Differential Scale

Semantic differential scale is a seven-point rating scale with end points associated with bipolar labels that have semantic meaning. Respondents are required to rate objects on a number of itemized, seven-point rating scales bounded at each end by one of two bipolar adjectives. This scale is popular in marketing and has been used in image studies, promotion strategy, and new product development studies.

Rate the brand "SMS" on the following features

- Reliable 3-----2-----1-----0----- -1 ----- - 2----- - 3 unreliable
- Modern 3 -----2-----1-----0----- -1 ----- - 2----- - 3 Old-fashioned

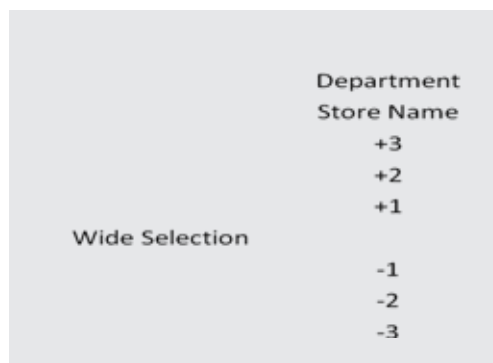
In a semantic differential scale the adjective pairs would be chosen to fit the subject. These adjective pairs are normally chosen on an arbitrary basis.

Stapel Scales

Developed by Jan Stapel, it is a uni-polar rating scale with 10 categories ranging from -5 to +5 without zero. For each item respondents assign a rating number (between +5 and -5). If the description of the object is appropriate, rating will be close to +5. Correspondingly, -5 would refer to the most inappropriate description.

The advantage over semantic scales is it does not require any pre-testing of the adjectives in use. Modern versions of the Stapel scale place a single adjective as a substitute for the semantic differential when it is difficult to create pairs of bipolar adjectives. The advantage and disadvantages of a Stapel scale, as well as the results, are very similar to those for a semantic differential.

However, the Stapel scale tends to be easier to conduct and administer.



Thurstone scale - The Thurstone scale would be a set of statements about the topic of interest we are studying. The researcher will ask the respondents to rate each statement, regarding its degree of favorableness along some assumed dimension. For example, consider the situation, where the researcher is conducting a study on customer / pilgrims experience for temple visit context of TTD Temple [Tirumala Tirupathi Devasthanam Temple] the statement, “*The background sounds were pleasant*” might be presented among a list of 10 statements which are measuring ‘*Customer/ Pilgrims Experience Management for TTD Temple visit*’.

- 1 Tirumala is connected by a well maintained and picturesque mountain road constructed by TTD
- 2 There was enough space to move around the temple
- 3 There was pleasant background music
- 4 The background sounds were pleasant
- 5 Absolute silence was observed in the temple premises
- 6 The divinity prevailing in the temple premises help to cleanse my mind and soul.
- 7 The Hundi on display were adequately spaced apart
- 8 There is enough number of cottages for a pleasant stay at Tirumala
- 9 Tasting, of Prasadam (Laddu) make the experience memorable
- 10 Tasting of Prasadam (Vada) make the experience memorable

The next step is to request the respondents to rate each statement on a 1-to-10 scale in terms of how much each statement indicates a *favourable* attitude towards TTD Temple Experience from the current visit. Here, we are not measuring what is their attitude towards TTD Temple Visit Experience – rather, we are interested what extent the respondent agree or disagree with the statements – on measuring ‘Experience’.

The researcher wants the respondents to rate the “favourableness” of each statement in terms of an attitude towards TTD Temple Visit Experience, where 1 = “*extremely unfavourable attitude towards TTD Temple Visit Experience* “ and 10 = “*extremely favourable attitude towards TTD Temple Visit Experience*”.

This one might have been appraised as a “7.6” on a scale of 1 to 10. The respondent would be expected to select one or more statements with which he agrees. Thus, the Thurstone methods illustrate well how a simple unidimensional scale might be constructed.

Measurement and Scaling Issues

Every marketing researcher would like to make use of the evolution of worldwide web – www; continuous rating scales have an advantage of

easily implemented on the Internet. The cursor can be moved on the screen in a continuous fashion to select the exact position on the scale which best describes the respondent's evaluation.

Moreover, the scale values selected by the respondents can be automatically entered into the database by the computer, thus increasing the speed and accuracy of processing the data. Similarly, it is also easy to implement all the three itemized rating scales on the Internet. Moreover, using the Internet one can search for and locate similar scales used by other researchers.

- All the primary scales of measurement can be implemented on the Internet. The same is true for the commonly used comparative scales.
- Paired comparisons involving verbal, visual, or auditory comparisons can be implemented with ease.
- However, taste, smell, and touch comparisons are difficult to implement.
- The process of implementing comparative scales may be facilitated by searching the Internet for similar scales that have been implemented by other researchers.

Database managers allow researchers to develop and test several different scales to determine their appropriateness for a particular application. Microcomputers have been used to administer paired comparison scales in taste tests.

- EzPair by Barry Cohen can design paired comparison scales and paired comparison product tests using statistical quality control techniques.
- It allows for testing to end early, without compromising test reliability, if one product is clearly winning.

Ethical Implications of Misusing Scale Descriptors

Ethical issues can arise in the construction of non-comparative scales. Consider, for example, the use of scale descriptors. The descriptors used to frame a scale can be manipulated to bias results in any direction.

A researcher who wants to project the client's brand favourably can ask respondents to indicate their opinion of the brand on several attributes using seven-point scales framed by the descriptors extremely poor to good.

Using a strongly negative descriptor with only a mildly positive shall have an interesting effect. As long as the product is not the worst, respondents will be reluctant to rate the product extremely poorly. In fact, respondents who believe the product to be only mediocre will end up responding favourably.

Ethical concerns also underscore the need to adequately establish the reliability, validity, and generalizability of scales before using them in a research project. Scales that are invalid, unreliable, or not generalizable to the target market provide the client with flawed results and misleading findings, thus raising serious ethical issues. Moreover, the researcher should not bias the scales so as to slant the findings in any particular direction.

When choosing a particular scaling technique, an attempt should be made to use the scaling technique that will yield the highest level of information feasible in the given situation. In many situations it may be desirable to use more than one scaling technique or to obtain additional measures using procedures other than the conventional scaling techniques.

Summary

In the marketing research domain, attitude measurement occupies most important role and this chapter discussed the significance and process of measuring attitude. A discussion is added on comparative and non-comparative process of measuring attitude and suitable examples are added for each type of measurement.

Discussion Questions

1. A researcher has just changed jobs. He kept photocopies of several research reports from his prior employer. One report contains a copyrighted attitude scale that was designed by a consulting company. The researcher finds that this attitude scale could be used

on his current project. Should the researcher go ahead and use the attitude scale without hiring the consulting company?

2. A researcher thinks many respondents will answer “don’t know” or “can’t say” if these options are printed along with “agreement categories” on the attitude scale. The researcher does not print either “don’t know” or “can’t say” on the questionnaire because the data will be less complicated to analyze and report. Is this proper?

Mini-Project

Develop three comparative (paired comparison, rank order, and constant sum) scales to measure attitude toward three popular brands of toothpaste (Pepsodent, Close-Up and Colgate). Administer each scale to five students. No student should be administered more than one scale. Note the time it takes each student to respond. Which scale was the easiest to administer? Which scale took the shortest time?

Self Assessment Questions

1. Introduce the concepts of measurement and scaling and show how scaling may be considered an extension of measurement.
2. Explain the steps involved in measurement.
3. What are the sources of variations in measurement?
4. State the methods to reduce variations in measurement.
5. Discuss the difference between validity and reliability
6. Discuss the types of validity measurement
7. How do you measure reliability?
8. Discuss measurement levels and scales one can make use of?
9. Explain nominal scale with an example
10. Explain ordinal scale with an example
11. Explain interval scale with an example
12. Explain ratio scale with an example
13. Compare the rank order scaling technique to interval scale?
14. What is attitude? How do you measure it?

15. Distinguish between comparative and non comparative rating scales
16. Explain: (i) ranking scale (ii) paired comparison scale.
17. Describe (i) dollar metric scale (ii) constant sum scale
18. What is Q sort type scale? How do you develop it?
19. What are the key considerations in non –comparative rating scaling
20. Explain: Continuous Rating and Graphic Rating Scaling procedures
21. What are itemized scales? Explain Likert, semantic differential and staple scales.
22. Explain Thurstone scaling procedure
23. Discuss the influence of internet and ethics on scaling.

CASE STUDY

A Study on Micro Finance Status

Self Help Group (SHG) is a self managed and regulated, community based organisation formed by the rural women. Group formation and its' successful functioning involves various management skills and abilities like any other institutions or organisations. Organisational discipline and systems related concepts such as members' qualification, their background, group meetings; attendance, recording minutes, transactions and decision making are required for the stability of the SHG.

Members rotate the group corpus and learn funds management, acquire repayment culture and accept responsibility for the decisions; they start and manage income generating activities with entrepreneurial, planning, organisational, communication and marketing related skills and abilities. Banks, NGOs, NBFCs and Microfinance Institutions provide loans for SHG members directly/indirectly to empower them and to provide capital for sustainable income generation activities and thereby facilitate rural development.

Though the loans are sanctioned and distributed after proper rating and assessment of the SHGs, timely and 100% repayment of loans is very

hard to achieve. Particularly, in Vellore district, various institutions face the problem and due to the bad experience, many of them started placing reasons and reject the Micro financing proposals from SHGs. This causes an increase in the PAR (Portfolio at Risk) of the organization which lends the money to the SHG and delay in repayment affects the firm's credit worthiness in the sight of its lenders and affects the firm's repayment (generally banks and other funding agencies fund NGOs of MFIs who in turn lend to the SHGs).

As far as internal lending within the SHG is concerned, it results in conflicts within members of the group and results in dissolution of the groups. Proper repayment is the key, as continuous rotation of funds brings about more development. Thus, the state governments understood the importance of repayments by the SHGs. The banks and Micro finance institutions are keen to know the causes for the lack of timely repayment and defaulters of SHG loans and identify solutions and strategies to rectify the problem.

If you are the researcher, appointed by the Banks and Micro Finance Institutions, what are your proposed research objectives? Briefly discuss about the research design you would prefer? What are the information you require from the Banks and MF Institutions? How will you prepare your questionnaire / interview schedules with various scaling methods you have studied? Prepare a specimen questionnaire for this research

UNIT - IV

Unit Structure

Lesson 4.1 - On Line and Secondary Data Collection

Lesson 4.2 - Primary Data

Lesson 4.3 - Field Operations

Lesson 4.4 - Editing and Coding

Lesson 4.5 - Data Analysis and Hypothesis Testing

Lesson 4.6 - Hypothesis Testing Methods

Lesson 4.7 - Multivariate Data Analysis

Lesson 4.8 - Report Writing and Presentation

Lesson 4.1 - On Line and Secondary Data Collection

Learning Objectives

- To discuss the methods of Online data collection
- To appreciate the need for secondary data and identify data sources

Introduction

Data collection is a critical phase in research. It requires proper identification of data sources and accessing them through appropriate data collection formats or instruments. Data collection methods are primarily classified into primary and secondary data sources. With the emergence of internet, we have a new opportunity for primary data collection – on line data collection. In this lesson, we shall examine on –line data collection and secondary data sources.

On –Line Data Collection

The advent of internet as a communication tool has provided new opportunities for data collection. Two types of approaches to data collection

are :(i) e-mail surveys and (ii) web surveys. In the first one, questionnaires are sent via e-mail to the select respondents. IN web surveys, the surveyors will keep questionnaire posted in a web site or present it to the browsers through 'pop-ups'.

Web Questionnaire Design

A web questionnaire site should be easy to use, have a logical flow, and have a graphic look-and-feel that creates an overall experience that motivates the respondent to cooperate from start to finish. Many of the guidelines for design of paper questionnaires apply to Internet questionnaires. There are, however, many important differences.

Interface - It should be easy for respondent to see the questions and answer them.. Respondents can click on what they want rather than having to type answers or codes.

Screen Design - However, several features of a respondent's computer may influence the appearance of an Internet questionnaire.

For example, a respondent's computer settings for screen configuration (e.g. 640 x 480 pixels versus 800 x 600 pixels) may result in questions that are not fully visible on the respondent's screen, misaligned text, or other visual appearance problems. It is better limit the horizontal width of the questions to 70 characters or less to decrease the likelihood of wrap-around text.

The questionnaire image the researcher/designer constructs on his or her computer may be different from the questionnaire image on the respondent's computer due to differences in software.

Layout decisions - Even if the questionnaire designer's computer and the respondents' computer are compatible, there are several other layout issues.

The first layout decision is whether the questionnaire will appear (i) page-by-page or (ii) one screen.

- **Page -by-page** - The paging layout going from screen to screen greatly facilitates skip patterns. Based on respondent's answers

to filter questions, the computer automatically inserts relevant questions on subsequent pages.

- ▶ **Screen** - If the entire questionnaire appears on the screen, the display should advance smoothly, as if it were a piece of paper being moved up or down.

The scrolling layout gives the respondent the ability to scroll down to read any portion of the questionnaire at any time and because there are no page boundaries problems can arise. For example, avoiding the problems associated with splitting questions and response categories may be difficult. On paper Likert scales are often shown in a multiple-grid format. Suppose a Likert scale consists of 15 statements and a grid-format layout places the response categories strongly agree, agree, disagree, and strongly disagree at the beginning of the question.

Scrolling down beyond the first few statements may not allow the respondent to simultaneously see both the statements at the end of the list and the response categories at the top of the grid.

Section heads - When a scrolling questionnaire is long, using multiple category or section headings is helpful to respondents. Provide appropriate links to allow users to go to the top and bottom parts of each section, enabling the respondent to navigate through the questionnaire more easily than having to scroll through the entire document.

Push buttons - Many responses to Internet questions require the respondent to activate his or her answer by clicking a radio button on a response. Like push buttons on automobile radios, clicking on an alternative response deactivates the first choice and replaces it with the new response. Push buttons with labels should clearly describe the actions to be taken. For example, if the respondent needs to go to the next page a large arrow labelled "NEXT" might appear in colour at the bottom of a screen.

Graphics and animation - Layout decisions must also be made about the use of colour, graphics, animation, sound, and other special features that the Internet makes possible.

One thing to remember is that for people with very powerful computers sophisticated graphics are not a problem. However, many

respondents' computers are not powerful enough to have complex features operationally delivered at a satisfactory speed.

For example, using a textured background, colour headings, and small graphics can make a questionnaire become more interesting and appealing, but they may present problems for respondents with older computers and/or low bandwidth Internet connections.

Status bar - With a paper questionnaire, the respondent knows how many questions he or she must answer. Because many Internet surveys offer no visual clues about the number of questions to be asked, it is important to provide a status bar or another visual indicator of questionnaire length. For example using a partially filled rectangular box as a visual symbol and a statement such as: "The status bar at top right indicates approximately what portion of the survey you have completed." increases the likelihood that the respondent will finish the entire sequence of questions.

Dialogue boxes - An Internet questionnaire uses special windows known as dialog boxes to display questions and record answers.

- **Drop-down box** It is a space saving device that allows the researcher to provide a list of responses that are hidden from view. Initially a general statement, perhaps "please select" or "click here" is shown. Clicking on a down-facing arrow makes the full range of choices appear. If the first choice in a list, such as "strongly agree", is shown with other responses hidden, the researcher is increasing his or her chances that response bias will occur. Drop-down boxes may present a problem for individuals with minimal computer skills who may not know how to reveal hidden responses behind a drop-down menu or how to move from one option to another in a moving-bar menu.
- **Check box** - Questions may be placed in a check box where several, none, or all responses may be checked.
- **Open-ended box** - They require respondents to use their keyboards to enter text for open-ended questions. Open-ended boxes may be designed as one line Text Boxes or Scrolling Text Boxes depending on the breadth of the expected answer. Of course, open-ended response questions require that respondents have both the skill

and the willingness to keyboard lengthy answers into the computer. Some open-ended boxes are designed so numbers can be entered for frequency response, ranking, or rating questions.

- ▶ **Pop-up box**–They are message boxes that can be used to provide highlighted information. For example, pop-up boxes may be used to provide a privacy statement.

Software for Questionnaire Design

A variety of software is available to researchers to undertake web surveys.

Web publishing software, such as FrontPage or Netscape Composer, is often used to format the questionnaire so the researcher will know how it should appear online.

Graphical User Interface (GUI) refers to software that provides an attractive and easy to use interface between a computer user and an application.

Questionnaire software with Boolean skip and branching logic is readily available. Most of these programs have hidden skip logic so respondents never see any evidence of skips. It is best if the questions the respondent sees always flow in numerical sequence. However, some programs number all potential questions in a numerical order and the respondent sees only the number on the questions he or she answers. Thus, a respondent may answer questions 1 thru 11 and then next see a question numbered 15 because of the skip logic.

Software can systematically or randomly manipulate the question a respondent sees. Variable piping software allows variables, such as answers from previous questions, to be inserted in to unfolding questions. Other software can randomly rotate questions, blocks of questions, and response alternative order from respondent to respondent.

The researchers can use software to control of the questionnaire flow. Respondents can be blocked from backing up, or can be allowed to stop mid-questionnaire and come back later to finish. If the respondent

fails to answer a question, or answers it with an incorrect type of response, an immediate error message appears. This is called error trapping. With forced answering software, respondents cannot skip over questions as they do in mail surveys.

The program will not let them continue if they fail to answer a question. The software may insert a bold-faced error message on the question screen or insert a pop-up box instructing the respondent how to continue. Some research suppliers offer interactive help desks to solve problems that might be encountered in completing a questionnaire.

Objectives of Secondary Data Research

Secondary data are gathered and recorded by “someone else” prior to (and for purposes other than) the current needs of the researcher. Secondary data are usually historical in nature, have already been assembled, and do not require access to respondents or subjects. Data are simply facts.

There are two general categories of research objectives: *fact finding* and *model building*.

Fact finding - A typical secondary research objective for a study might be to uncover all available information about consumption patterns for a particular product category or to identify demographic trends that affect an industry or preference pattern for the brands and so on.

For example, if we want to understand the nature of ‘MEDIA and ENTERTAINMENT’ industry in India; a common secondary data study designed to find facts might be a market tracking study. Market tracking refers to the observation and analysis of trends in industry volume and brand share over time, typical media vehicles used by the marketers, product wise / brand wise spending pattern from various published reports.

Model building - As a general objective for secondary research, it is more complicated than simple fact finding. Model building involves specifying relationships between two or more variables. Model building can involve the development of descriptive or predictive equations.

Sales forecasting is the process of predicting sales totals over a specific future time period. Different models are used for predicting the sales. Managers often estimate market potential using secondary data. The researcher may estimate market potential by converting different types of data that are available from two or more sources.

For example, if you are consulting for a real estimate equipment manufacturer, if one source of data indicates that 10 percent of all electrical contractors intend to buy a drill and another source indicates that there are 80,000 electrical contractors then it may be estimated that 8,000 drills will be sold to electrical contractors

Business researchers often use internal company sales records to project sales. This is a popular method adopted by many organizations. The term *data mining* refers to the use of powerful computers, to dig through volumes of data to discover patterns about an organization's customers and products.

Market basket analysis is a form of data mining that analyze anonymous point of sale transaction logs to identify coinciding purchases or relationships between products purchased and other retail shopping information. When the identity of the customer who makes repeated purchases from the same organization is known, an analysis can be made of sequences of purchases. Sequence discover, the use of data mining to detect sequence patterns, is a popular application among direct marketers, such as catalogue retailers.

Classification of Secondary Data

The sources of secondary data can be classified as internal or external.

Internal Data

Data that are internal to the organization refers to data created, recorded, or generated by another entity. Most organizations routinely gather, record, and store internal data for solving future problems. For example, sales departments continually gather data through their sales representatives

Aggregating or desegregating internal data is a frequent form of internal research. To collect the *internal data* more efficiently and effectively, the researcher should know the company's operating procedures very clearly; then only he can establish very systematic methods for gathering / recording the information required.

In the recent years, many companies use the advantage of internet / personal computer evolution; many dealers / distributors are networked with the respective companies and the companies can quickly collect vast amount of data in no time. Sales data are valuable information for any marketing project because it shows the exact results of a program, salesperson, or sales region.

Detailed information can be gathered on precise questions; for example, the percentage of sales to industry versus government, or sales broken out by company accounts. With planning, sales data can be recorded in the companies' management information systems to allow for optimal use by analysts.

External Data

External data sources can be broadly classified into 1) Books and periodical, 2) Web sources 3) Media sources 4)Government Sources, and 5) Commercial Sources.

Books and periodicals - Books and periodicals provide a wealth of information. Libraries stock many bibliographies, guides, directories, and indexes. Professional journals and commercial business periodicals can be especially valuable sources of data. Original research works, research abstracts, opinions and discussions are available for researcher. Besides this, reports are found in library. They include reports published by state and central governments, colleges and universities, professional associations like Federation of Indian Chambers of Commerce and Industry [FICCI], Confederation of Indian Industries [CII], and catalogues of publishers like Macmillan, Excel and Serial.

Web sources - The web has become a rich repository of information. Different search engines like Google, Yahoo and others provide access to a variety of data sources.

Government sources: Indian government provides census data, which can give important information on demographics, manufacturers, retail trade agriculture, transportation, and so on. Moreover, we know that the quality of census data is very high, making it a very reliable and useful source.

State and central government's ministries periodically publishes many reports on census, industrial production, production details of various products and commodities, human resources development activities, policy documents; again, these reports provide depth insight about the research topics / objectives / problems.

Government agencies produce a prolific amount of data. Reserve Bank of India periodically published information about various parameters like production details various products, growth in deposits, growth in exports / imports, industries growth, investment made by Foreign countries; these information are valid for any marketers to understand the macro scenario before getting into any research perspectives.

Media sources: Information on a broad range of subjects is available from broadcast and print media. Annual Industry surveys, periodical reports on Industry banking and finance and reviews of stock markets, are common products in news papers. Dedicated News channels daily present some reviews and trends on business, markets and interviews with experts. Besides this there are advertisements.

Commercial sources: Numerous firms specialize in selling information. They present Demographic and census updates, Attitude and public opinion research, Stock market trends and many compilations of data on other interesting aspects.

The growing demand for marketing data in recent years has given rise to a number of companies which make a business of collecting and selling marketing information. Few companies restrict their activities to research on specific issues faced by their clients; certain others collect certain marketing data on a continuing basis. Market tracking refers to the observation and analysis of trends in industry volume and brand share over time. Market tracking through optical character recognition such as *the Universal Product Code* and other optical scanners provides a wealth of

accurate and rapid product and brand sales information collectively known as scanner data. *Scanner data* are collected by passing merchandise over a laser scanner that optically reads the bar coded description printed on the merchandise and compiles a database of sales/inventory. Its advantages and disadvantages can simply be listed.

For example – AC Nielsen is one such firm keeps working on continuous efforts on various industries like ‘Retail Audit Survey’ on an annual basis. This information is sold on subscription to all buyers. Even government organisation like National Council for Applied Economic Research [NCAER] conducts researches on Indian Consumers periodically and these reports are sold for a price.

Both online and offline databases are available for sale consisting of bibliographic, numeric, full-text, directory, and specialized databases. In addition, directories of databases exist to aid in locating the proper information. While databases are not without their disadvantages, their use by marketing researchers and market research firms is becoming indispensable.

Advantages and Disadvantages of Secondary Data

The advantages and disadvantages of secondary data can be stated as follows.

Advantages - Secondary data can cover a broad range of factors that affect the problem at hand. It does not always fit the specific problem at hand, but can be useful in developing an approach to the problem and providing a comprehensive understanding of the problem environment. Examination of available secondary data is a prerequisite to the collection of primary data. Proceed to primary data only when the secondary data sources have been exhausted or yield marginal returns.

Disadvantages - Because secondary data have been collected for purposes other than the problem at hand, their usefulness to the current problem may be limited in several important ways, including relevance and accuracy.

Criteria for Evaluating the Quality of Secondary Data

The marketing researchers have to be very cautious when using secondary data sources; he may evaluate the data based on criteria like - error, currency, objectives, nature, and dependability.

Error - Researchers should be aware of the fact that no single source of secondary data can provide information that completely answers the need of the present problem. Moreover, methods used for analysis by different sources may have certain weaknesses. One may suffer from biases, the other may be older and the third may not be very accurate, and so on.

Currency - the data may not be recent one. Sometimes it may be outdated too.

Objectives – The objective of the researcher in compiling data may be different from the objective of research. In such cases, its use will be limited to providing back ground information.

Nature - The data may be different in terms of quantitative or qualitative aspects and researcher may not be able to appreciate it.

Dependability- Four ethical issues that are the most pertinent are:

- The researcher should aware of the needless collection of primary data when the problem can be addressed based only on secondary data.
- Also, overriding importance to secondary data sources whereby, limiting the research to only secondary data when primary data are needed to answer the research question.
- The use of secondary data that is not relevant or applicable to the research problem.
- The use of secondary data that has been gathered through morally questionable means.

Summary

A brief summary on internet survey is provided in this chapter. Various software programmes that are useful for internet surveys are

introduced. The marketing researchers have to be very cautious when using secondary data sources; this chapter introduces various sources of secondary data and merits and demerits of them also. A discussion is made on various advantages and disadvantages of various sources and provided a set of criteria for evaluating them.

Discussion Question

The use of face -to face data collection is superior than data collection by use of phones, mail questionnaires and web surveys. Discuss.
Mini-project

Search for more information on web surveys and prepare a note on it.

Lesson 4.2 - Primary Data

Learning Objectives

- To discuss the importance of primary data and identify various sources of primary data
- To discuss tools for collection of primary data

Introduction

While the secondary data is collected from various established sources, primary data are originated by the researcher for the specific purpose of addressing the research problems faced by him /her. This primary data may be quantitative or qualitative in nature; it may be collected using structured or unstructured format to interpret them. Many research problems being unique in nature, the researchers have to collect primary data by asking respondents.

Primary Data Collection Methods

There are some more variables like personal or impersonal / structured telephonic through mechanical devices and traditional one-to-one conversations methods are also considered as method of classifying primary data collection methods. In the following sections, we will briefly discuss them. A classification scheme is given Table.

Respondent's knowledge about Objectives of research	
Undisguised	
Focus group	1.
Depth	2. Techniques
Observations	
	Psychological tests – such as some attitude measurements

Non-structured – Undisguised Method

This method is found in qualitative research, where the data collected are of highly qualitative in nature and scope of applying statistical techniques are almost impossible or not warranted.

Focus Groups

A focus group is a small group of people. A trained moderator conducts an interview in a non-structured manner in a natural manner. The moderator's role is to introduce a topic and to encourage the group to discuss it among themselves. This is suitable for 'Exploratory Research Designs'.

Step-1 Examine the objectives of the research project. It provides the rationale for conducting the focus group.

For example, if the researcher is conducting a study on 'AIR FLYING EXPERIENCE'; thus, beginning with the main objective of the research project—assessing the various factors considered by the customers while choosing an airline for air travel, strengths and weaknesses of a particular operator vis-à-vis its competitors—the objectives of the qualitative research are formed.

Step-2 Specify the objectives—outlines the goals of the study in order to guide the interview.

For purposes of illustration, assume one objective of qualitative research is to discover the primary factors that influence consumers' choice of a particular airline operator.

Step-3 State the questions to be answered from the focus group—a detailed set of questions to be answered.]

Based on this objective, several questions pertinent to the study can be asked:

- Would you like to travel always by this airline? Why?
- Do you like to the services of customer care professionals / air hostess/ ground staffs? Why?

- How important is convenience to consumers?
- How important is variety of selection?
- Are consumers willing to pay more if there is personal service?
- How far are consumers willing to travel?

Step-4 Develop a Moderator's Outline. Based on the pertinent issues raised by the objectives of qualitative research, a moderator's outline can be devised. An effective focus group moderator prepares a discussion guide to help ensure that the focus group will cover all topics of interest. The *discussion guide* consists of written prefatory remarks to inform the group about the nature of the focus group and an outline of topics/questions that will be addressed in the group session. It ensures that the moderator understands the nature of the study and the key findings desired by the client.

Step-5 Conduct the interview The moderator's job is to develop a rapport with the group and to promote interaction among its members. Moderator is responsible for setting a tone in the focus group that makes the respondents feel comfortable enough to discuss their thoughts. The sessions should be as relaxed and natural as possible. The discussion may start out general, but the moderator should be able to focus it on specific topics.

Note that moderator also must establish the rules, direct the study, communicate the objectives to the respondents, probe the respondents for deeply held attitudes, and facilitate a free-flowing discussion in the relevant areas. Finally, he must summarize the group's responses to ensure agreement on his interpretation of their responses.

Step-6 Review tapes and analyze data—allows the researcher to uncover inconsistent responses, missed remarks, nonverbal communication and new ideas.

Step-7 Summarize findings and plan follow-up research—to probe further into the issues and sample statistically significant populations. Finally, ideas for follow-up action can be generated. For example, based on the focus group results we can now proceed to quantitative research.

Moderator types - On occasion, the focus group study designed in such a way that may have two moderators. These moderators can play different roles while conducting the focus group discussions. The difference between a dual-moderator group and a dueling-moderator group is that in the case of a dual-moderator group, one moderator is responsible for the smooth flow of the session and the other is responsible for ensuring discussion of specific issues. In the case of a dueling-moderator group, the two moderators take opposite positions on the issues to be discussed.

Advantages of Focus group There are four primary advantages of the focus group: (1) it allows people to discuss their true feelings and convictions, (2) it is relatively fast, (3) it is easy to execute and very flexible, (4) it is inexpensive.

Specific advantages of focus group interviews can be categorized as shown in Box.

Advantages of Focus Groups

Synergism: the combined effort of the group will produce a wider range of information, insights and ideas than will the accumulation of separately secured responses.

Serendipity: an idea may drop out of the blue, and affords the group the opportunity to develop such an idea to its full significance.

Snowballing: a bandwagon effect occurs. One individual often triggers a chain of responses from the other participants.

Stimulation: respondents want to express their ideas and expose their opinions as the general level of excitement over the topic increases.

Security: the participants are more likely to be candid because they soon realize that the things said are not being identified with any one individual.

Spontaneity: people speak only when they have definite feelings about a subject; not because a question requires an answer.

Specialization: the group interview allows the use of a more highly trained moderator because there are certain economies of scale when a large number of people are “interviewed” simultaneously.

Scientific scrutiny: the group interview can be taped or even videoed for observation. This affords closer scrutiny and allows the researchers to check for consistency in the interpretations.

Structure: the moderator, being one of the groups, can control the topics the group discusses.

Speed: a number of interviews are, in effect, being conducted at one time.

Disadvantages of Focus Group

- The group is not representative of the general population
- There is extreme dependence on the performance of the moderator
- It is hard to correctly interpret the responses.
- Coding and analysis is cumbersome.
- The results are subject to researcher or client bias.

Focus Groups Use Video Conferencing

In the recent years, a number of focus groups use videoconferencing as a device to overcome the participation of respondents from various places. With traditional focus groups managers and creative personnel often watch the moderator lead the group from behind one-way mirrors. If the focus group is being conducted “out of town,” the executive personnel usually have to spend more time in airplanes, hotels, and taxis than they do watching the group session. With video-conference focus groups, they can stay home.

Streaming media is a method of making audio, video and other multimedia available in real-time over the Internet or corporate intranets, with no download wait and no file to take up space on a viewer’s hard disk. This new technology for digital media delivery now allows researchers to “broadcast” focus groups that can be viewed online.

The offsite manager uses RealPlayer or Microsoft Media Player to view focus groups on their own computer rather than at a remote location. Except for the quality of the video when there are bandwidth problems the experience is similar to videoconferencing.

Online Focus Group

Research companies often set up a private chat room on their company Web sites for focus group interviews. Participants in these chat rooms feel their anonymity is very secure. Often they will make statements or ask questions they would never address under other circumstances. This can be a major advantage for a company investigating sensitive or embarrassing issues.

The group participants either keyboard their remarks during a chat room format or when they are alone at their computers. Because respondents enter their comments into the computer, transcripts of verbatim responses are available immediately afterward the group session. Online groups can be quick and cost efficiency. However, because there is less interaction between participants, group synergy and snowballing of ideas can suffer.

Depth Interview Method

Depth interview method is also often applied in the case of 'Exploratory Research designs'. Concepts may be discussed with top executives and knowledgeable managers who have had personal experience in the field being researched. This constitutes an informal experience survey. Such a study may be conducted by the business manager rather than the research department for the following purposes.

- Detailed probing of the individual.
- Discussions on topics considered confidential, sensitive, or embarrassing.
- Situations where strong social norms exist and the individual may be easily swayed by group response.
- Detailed understanding of complicated behaviour.
- Interviews with professional people.
- Interviews with competitors who are unlikely to reveal the information in a group setting.
- Situations where the product consumption experience is sensory in nature affecting mood states and emotions.

Procedure – The following steps may be followed for conducting depth interview.

Step-1 A depth interview is conducted on a one-on-one basis. Choose the expert to be interviewed.

Step-2 The respondent is probed in depth by a highly skilled interviewer to uncover underlying motivations, beliefs, attitudes, and feelings on a topic. The interviewer attempts to get the subject to talk freely and the direction of the interview is influenced heavily by the subject's answers.

Step-3 Summarise the findings and draw conclusions

Advantages of depth interview - The major advantages of depth interviews are that great depths of insights can be uncovered, the responses can be directly associated with the respondent, and there is no social pressure to conform to a group response.

Disadvantages of depth interview - Depth interviews have lost their popularity recently because of the following difficulties.

- Skilled interviewers capable of conducting depth interviews are expensive and difficult to find.
- The lack of structure makes the results very susceptible to the influence of the interviewer. The quality and completeness of the results depends very heavily on the skills of the interviewer.
- The data obtained is difficult to analyze and interpret.

Tips for effectiveness - The quality of responses is very crucial and it completely depends upon the skill set of the interviewer. The interviewer has to conduct him / her in very professional manner with the respondents to get highest cooperation from the respondents.. Meeting the respondents with prior permissions / appointments, place of meeting, procedure for recording the responses are some of the key issues to be planned.

Observation Method

organisations trace huge amount of data through observation mode. *Scientific observation* is the systematic process of recording behavioural patterns of people, objects, and occurrences without questioning or communicating with them.

Types of observation The researcher utilizes different observation methods.

- **Structured Vs. Unstructured observation** - Structured observation is appropriate when the marketing research problem has been clearly defined and the information needed has been specified. It requires that the researcher specify in detail what is to be observed and how the measurements are to be recorded. Unstructured observation is appropriate when the problem has yet to be formulated precisely, and flexibility is needed in observation to identify key components of the problem and to develop hypotheses.
- **Disguised Vs. undisguised observation** - In disguised observation, the respondents are not aware that they are being observed, whereas in undisguised observation the respondents are aware that they are under observation. Disguised observation is used when it is felt that the respondents would act differently under direct observation.
- For example, while making a study on the purchase of sensitive or personal products, the researchers often use the disguised method of observations. Many of the retail branded apparel stores, the Closed Circuit Camera Footage (CC TV) are fixed by the manufacturer to know the consumer preference for various colour of apparel, which is often known the customers.
- **Natural Vs. Contrived Observation** - Natural observation involves observing behaviour as it normally takes place in the environment. Contrived observation takes place in an artificial environment that has been created by the researcher. Natural observations allow the researcher to observe actual behaviour, but do not allow for inferences on the causes of behaviour. Contrived observation enables the researcher to control more of the variables that affect behaviour.

Observation can be classified based on the observer as personal or mechanical

- **Personal observation** - The researcher himself goes to the field and personally observes actual behaviour as it occurs, and the observer merely records what takes place. The researcher does not attempt to control or manipulate the phenomenon being observed. This method requires researcher's efforts and time; if field forces are employed, then the researcher has to train them on method of observing.
- **Mechanical observation** - These are devices used to continually record ongoing behaviour for later analysis. Closed circuit camera, Toll Plaza Tracking system, Customer Shopping Behaviour Tracing Equipments and many more to say, are some of the equipments used in the recent times, to trace the consumer behaviour.

Observation can be classified based on what is observed.

- **Audit** - This process involves collection of data by examining physical records or performing inventory analysis. There are two distinguishing features of an audit: (1) data are collected personally by the researcher or by representatives of the researcher and (2) the data are based upon counts, usually of physical objects other than people.
- **Content analysis** - It is the objective, systematic, and quantitative description of the manifest content of a communication. Marketing research applications involve observing and analyzing the content or message of advertisements, newspaper articles, television and radio programs, can be considered as examples.
- **Trace analysis** - It is an approach in which data collection is based on physical traces of past behaviour where physical traces are evidence of some past event or occurrence.

Evaluating observation methods - The different observation methods are evaluated on various bases as given under.

Structure- As far as structure is concerned, in personal observation, it is low; in trace analysis, it is medium, and audit and content analysis

methods, it is high. Mechanical observation can vary widely from low to high depending upon on the methods used. Methods such as optical scanners are very structured in that the characteristics to be measured, mechanical methods, such as the use of hidden cameras to observe children at play with toys, tend to be unstructured.

Degree of disguise - As far as audits are concerned, the degree of disguise is low as it is difficult to hide the identity of auditors [the researcher who is doing the analysis]. Personal observation offers a medium degree of disguise. Trace analysis and content analysis offer a high degree of disguise as the data are collected “after the fact.” Some mechanical observations, such as hidden cameras, offer excellent disguise whereas the use of others, such as the use of psycho-galvanometers, it is very difficult to disguise.

Ability to observe in a natural setting - It is low in trace analysis, medium in the case of content analysis. Personal observation and audits are excellent on this score. Mechanical observation methods vary from low (e.g., use of psycho-galvanometers) to high (e.g., use of turnstiles).

Observation bias - It is low in the case of mechanical observation because a human observer is not involved. It is also low as for as audits. It is at medium level, for trace analysis and content analysis, since in both the methods, human observers are involved and the characteristics to be observed are loosely defined. It is high for personal observation due to the use of human observers.

Data analysis bias - It is low for audits and content analysis because the variables are precisely defined. Trace analysis has a medium degree of bias as the definition of variables is not very precise. Mechanical observation methods can have a low (e.g., scanner data) to medium (e.g., hidden camera) degree of analysis bias depending on the method.

Advantages of Observation Methods

The advantages of observation methods are:

- Observational methods permit measurement of actual behaviour.
- The potential bias caused by the interviewer and the interviewing process is eliminated or reduced.

- Certain types of data can be collected best only by observation.
- If the observed phenomenon occurs at relatively frequent intervals and is of short duration, observational methods may cost less and be faster than the survey methods.

Disadvantages of Observation

The following disadvantages of observation merit attention.

- Very little can be inferred about the motives, beliefs, attitudes, and preferences underlying the observed behaviour.
- Selective perception of the observer can bias the data.
- In some cases the use of observational methods may border on being unethical because the subjects' behaviour is being monitored without their explicit knowledge or consent.

Structured – Undisguised Method

The response generated from the study is highly structured and the respondents know for what purpose [undisguised] the data have been collected by the researchers. This method is used for descriptive studies / quantitative research. The data can be analysed using sophisticated statistical methods.

Survey Method

Surveys require asking people, respondents, for information using either written or verbal questioning. Questionnaires or interviews collect data through the mail, on the telephone, or face-to-face.

Interviews

Interview method can be employed in different ways.

Personal in-home interview - In this method, the researcher or field data collection executives visit residences of respondents and ask questions face-to-face in their homes. This method requires more of field work and costlier and expensive.

Mall-intercept personal interview - Respondents are intercepted while they are shopping in a mall, and then a questionnaire is administered to them by the interviewer. The method may result in poor quality responses. Since the sampling method falls under the category of convenience, it is difficult to generalize the findings.

Computer-assisted personal interview - Respondents are requested to sit in front of a computer terminal. She or he answers the questionnaire on the screen by using the keyboard and/or mouse.

Telephone interview - It involves phoning a sample of respondents and asking them a series of questions. It is more appropriate, when the amount of information required is limited and highly structured. It is one of the quickest methods and consumes less time than other methods.

Computer-assisted telephone interview - The computer dials a telephone number, the interviewer asks the questions on the screen of the computer, and the interviewer records the respondents' answers directly into the computer. There are computer softwares, which links the responses to a database directly.

Mail interview - In this method, the researchers sends by postal/mail the questionnaires to pre-selected potential respondents. The respondents complete and return the questionnaires by return mail. If an incentive is attached to the filled responses, the respondents may be motivated to answer promptly. Poor response rate and more time to collect the responses are some of the weakness with this method.

Mail panel - This method consists of a large and nationally representative sample of households which have agreed to periodically participate in mail questionnaires, product tests, and telephone surveys conducted by the specific marketing research organization. For such panel enrolment, the firm has to pay a nominal amount as participation fees.

E-mail interview - The survey request and questionnaire is written within the body of the e-mail message and send to the identified respondents [whose emails have been collected]. The e-mails are sent out over the Internet.

Internet interview - Internet or Web surveys use 'hypertext mark-up language' (HTML), the language of the Web, and are posted on a Web site. Respondents may be recruited over the Internet from potential respondent databases maintained by the marketing research firm or they can be recruited by conventional methods (mail, telephone). In India, today we have access to websites such as 'SurveyMoneky.com' and 'Qualtrics.com', which allow us to build online questionnaire and email them selected respondents.

Questionnaires

Questionnaires are common tools of data collection in many research projects. However, questionnaire is not an easy task. It has to consider mainly the (i) purpose of research (ii) information relevant to research objectives and (iii) ability and willingness of respondent to answer the questions. Relevance and accuracy are the two most basic criteria to be met if the questionnaire is to achieve the researcher's purpose. In order to achieve this, several decisions must be made.

Questionnaire relevancy - A questionnaire is relevant if no unnecessary information is collected and if only the information needed to solve the marketing problem is obtained. To ensure information relevance, the researcher must be specific about data needs; there should be a rationale for each item, and all possible omissions should be considered.

Questionnaire accuracy - Accuracy refers to right data. It can be obtained only when questions do not make misrepresentation or lead to misunderstanding. It means the wording and sequence should be right.

While it is generally believed that one should use simple, understandable, unbiased, unambiguous, and non-irritating words, no step-by-step procedure can be generalized. Respondents tend to be most cooperative when the subject of the research is interesting - if questions are lengthy, difficult to answer, or ego threatening, there is a high probability of biased answers. '

Phrasing Questions - There are many ways to phrase questions and many standard question formats have been developed in previous research. We may categorize two basic types of questions asked on the

amount of freedom respondents are given in answering: Open-ended response versus fixed-alternative questions.

Open-ended response questions require respondent to write the answers in their own words. They are free response questions.

Merits - Open-ended response questions are most beneficial when the researcher is conducting exploratory research. By gaining free and uninhibited responses, the researcher may find some unanticipated reaction toward the project. They may also be useful at the beginning of an interview as they allow the respondent to warm up to the questioning process.

Demerits - The cost of open-ended response questions is substantially higher than that of fixed-alternative questions, since the job of coding, editing, and analyzing the data is quite extensive. Also, open-ended response questions allow potential interviewer bias to influence the answer - even the best interviewer can take shortcuts in recording answers

Fixed-alternative questions or closed questions, give the respondents specific, limited, alternative responses and ask the respondent to choose the response closest to his or her viewpoint. The following types of fixed alternative questions are in use.

Single-dichotomy or dichotomous: alternative questions: require that the respondents choose one of two alternatives. The answer can be a simple “yes” or “no” or a choice between “this” and “that.”

Multi-choice alternatives: They ask a respondent to choose one and only one - response from among several possible alternatives.

- The frequency determination question is a determinant choice question that asks for an answer about the general frequency of occurrence.
- Attitude rating scales, such as the Likert 5 point scale (Strongly agree- Agree –Neutral-Disagree- Strongly disagree).
- The check list question allows respondents to provide multiple answers to a single question. In many cases, the choices are adjectives

that describe a particular object. There should be no overlap among categories in the check list - each alternative should be mutually exclusive, that is, only one dimension of an issue should be related to that alternative. The researcher should strive to ensure that there are sufficient response choices to include almost all possible answers.

Merits - Fixed-alternative questions require less interviewer skill, take less time, and are easier for the respondent to answer.

Demerits – The forced choice limit the scope of getting accurate presentation of views from respondents. They tend to approximate their answers.

However, including a category lower than the answers you expect often helps to negate the potential bias caused by respondents avoiding an extreme category. Respondents, rather than stating why they chose a given product, may select an alternative among those presented. Or, as a matter of convenience, they may select a given alternative rather than thinking of the most correct alternative.

What is the choice of researcher?

Most questionnaires include a mixture of open-ended and closed questions. Each form has unique benefits; in addition, respondent boredom and fatigue are eliminated with a change of pace offered by a mixture of question types. In general, mail and telephone questions must be less complex than those utilized in personal interviews. Questionnaires for telephone and personal interviews should be written in a “conversational” manner.

Art of Asking Questions

In developing a questionnaire, there are no hard and fast rules. Some guidelines have been developed to avoid the most common mistakes.

Questions in simple language: Words used in a questionnaire should be readily understandable to all respondents. The technical jargon of top executives should be avoided.

Avoid leading questions: Leading questions suggest or imply certain answers. Is not Pepsi a tasty brand ? Such questions may lead one to say yes and result in a “bandwagon effect” which threatens the study’s validity. Partial mention of alternatives is a variation of these phenomena. If you are asked to mention a tasty brand , which brands like Pepsi, Coke and so on come to your mind? A question statement may be leading because it is phrased to reflect either the negative or positive aspects of an issue. To control for this bias, split-ballot technique, which reverses the wording of attitudinal questions for 50 percent of the sample, can be used.

Avoid loaded questions *Loaded questions* suggest social desirability or are emotionally charged. Some questions invite only positive answers. Invoking the status quo is a form of loading that result in bias because the majority of people tend to be resistant to change.

Asking respondents “how often” leads them to generalize about their behavior and one is more likely to portray one’s ideal behavior rather than one’s average behavior.

An introductory counter-biasing statement to a question, that reassures respondents that their “embarrassing” behavior is not abnormal, may help yield truthful responses. Also, an assurance of anonymity may help elicit honest responses to embarrassing questions.

Avoid ambiguity: Items on questionnaires are often ambiguous because they are too general. Indefinite words such as frequently, often, ready, etc., have many different meanings. Use of such words should be avoided - the questions should be as specific as possible.

Avoid double-barrelled items: A question covering several items at once is referred to as a double-barrelled question. It leads to confusion. Example : Do you like Pepsi and Coke ? If a consumer likes Pepsi and not Coke, how can he answer this question?

Sequencing the Questions

The order of questions is important. . For example, if the respondents’ curiosity is not aroused with the initial questions, they can become disinterested and terminate the interview.

Order bias It results from the sequencing of questions. Order bias tends to distort survey results. Questions which ask specific information tend to take time and need thinking, than the general questions. It is advisable to ask the general questions before the specific questions to obtain the freest of open-ended responses. This technique is known as the funnel technique, and it allows researchers to understand the respondent's frame of reference before asking more specific questions

When using attitude scales, there also may be an **anchoring effect**. That is, the first concept measured tends to become a comparison point from which subsequent evaluations are made. Randomization of these items on a questionnaire helps to minimize this order bias.

Rarely do marketing researchers print alternative question forms to eliminate problems arising from order bias. A more common practice is to pencil X's or check marks on the printed questionnaires to indicate that the interviewer should start a series of repetitive questions at a certain point.

Filter questions minimize the asking of questions that may be inapplicable, and pivot questions may be used to obtain information that the respondent may be reluctant to provide.

For example, a respondent is asked "Is your family income over \$30,000?" If under, ask "Is it over or under \$10,000?" If over, ask "Is it over or under \$50,000?" Notice the logical order of questions which can help ensure the respondent's cooperation, and can help eliminate any confusion or indecision.

Layout of a Questionnaire

The layout and attractiveness of the questionnaire are of crucial importance. In mail questionnaires, often the rate of return can be improved by adding the money that might have been used as an incentive, to improve the attractiveness and quality of the questionnaire. Questionnaires should be designed to appear as short as possible and experienced researchers have found that it pays to carefully phrase the title to be printed on the questionnaire.

The researcher can design the questionnaire to make the interviewee's job of following interconnected questions much easier by utilizing several forms, special instructions, and other tricks of the trade. One researcher-client issue worth mentioning is piggybacking, which occurs when a questionnaire contains questions pertaining to more than one client. One client's questions take up a part of the questionnaire, while a second client's study takes up the rest. In these cases all clients must be aware of and consent to the arrangement. Unfortunately, piggybacking is sometimes used without disclosure to the clients for the sole purpose of increasing the researcher's profit. This is unethical.

Finally, the researcher has the ethical responsibility of designing the questionnaire so as to obtain the required information in an unbiased manner. Also, the questionnaire should be thoroughly pretested before fieldwork begins or an ethical breach has occurred.

Advantages of the Survey Method

- The questionnaire is simple to administer.
- The data obtained are reliable as the responses are limited to the alternatives stated and the standardization of the questionnaire reduces the variability in the results caused by differences in interviewer characteristics.
- The coding, analysis, and interpretation of data are also relatively simple.

Disadvantages

- The respondents may not be able or willing to provide the desired information.
- Respondents may be unwilling to respond if the information requested is sensitive or of a personal nature.
- Structured questions and fixed-response alternatives may result in loss of validity for certain types of data such as those involving beliefs and feelings.
- It is difficult to word the questions properly.

Criteria to Evaluate Different Survey Methods

The marketing researcher has to consider a set of appropriate and relevant factors for evaluating various survey methods and choose the best suited one for a particular research project. Various such criteria include:

design	control	response	respondent view	Result
flexibility of data collection	sample control	response rate	perceived anonymity	cost
diversity of questions	control of the data collection environment	quantity of data,	social desirability/ sensitive information	speed,
use of physical stimuli	control of field force,	potential for interviewer bias		

Flexibility - The flexibility of data collection is determined primarily by the extent to which the respondent can interact with the interviewer and the survey questionnaire. For example, the personal interview, whether conducted in-home or as a mall-intercept interview, always have the highest flexibility of data collection.

Diversity of questions - The diversity of questions that can be asked in a survey depends upon the degree of interaction the respondent has with the interviewer and the questionnaire, as well as the ability to actually see the questions. Therefore, in-home, mall-intercept, allow for diversity. In mail surveys, mail panels, and e-mail surveys, less diversity is possible. In traditional telephone interviews the respondent cannot see the questions while answering and this limits the diversity of questions.

Use of physical stimuli - Often, the firms would like to use physical stimuli such as the product, a product prototype, commercials, or promotional displays during the interview. In these cases, personal interviews conducted at central locations are preferable to in-home interviews. Mail surveys and mail panels are moderate on this dimension, because sometimes it is possible to mail the facilitating aids or even product samples. The use of physical stimuli is limited in traditional telephone interviews and in e-mail surveys.

Sample control - Sample control is the ability of the survey mode to reach the units specified in the sample effectively and efficiently. This will help the marketing researcher to plan and cover appropriate sample size in time. In-home personal interviews offer the best sample control. Mall-intercept interviews allow only a moderate degree of sample control. Moderate to high sampling control can be achieved with traditional telephone interviews. The degree of sample control in mail surveys is low. Mail panels, on the other hand, provide moderate to high control over the sample.

Control of the data collection environment - Personal interviews conducted at central locations offer the greatest degree of environmental control. The environment can affect the quality of the responses given by the respondents. In-home personal interviews, traditional telephone methods offer moderate control. In mail surveys and panels, e-mail, and Internet surveys, the researcher has little control over the environment.

Control of field force - The field force consists of interviewers and supervisors involved in data collection. Personal interviews involved field force can affect the quality of responses unless they are trained properly. Mail surveys, mail panels, e-mail, and Internet surveys eliminate field force problems. Traditional telephone interviews, mall-intercept methods offer moderate degrees of control because the interviews are conducted at a central location, making supervision relatively simple. In-home personal interviews are problematic in this respect.

Response rate-Personal - in-home, mall-intercept, and computer assisted interviews yield the highest response rate. Mail surveys have poor response rates. However, response rates in mail panels are typically in good among all the methods, since respondent are selected on cooperation. Internet surveys have the poorest response rates, even lower than e-mail surveys. This is due to the fact that some respondents may not have access to e-mail / the Web. Also they may lack the skill to use internet.

Quantity of data - In-home personal interviews allow the researcher to collect large amounts of data, which are of high quality. This method allows the respondents to clarify any doubts if they have on questions and improve their understanding. In contrast to in-home interviews, mall-intercept provides only moderate amounts of data and less of respondents'

time to clarify any doubts. Mail surveys too suffer by this drawback. Mail panels, on the other hand, can generate large amounts of data because of the special relationship between the panel members and the sponsoring organization.

Perceived anonymity - Perceived anonymity refers to the respondents' perceptions that their identities will not be disclosed by the interviewer or the researcher. Perceived anonymity of the respondent is high in mail surveys, mail panels, and Internet surveys because there is no contact with an interviewer while responding. It is low in personal interviews due to face-to-face contact with the interviewer.

Social desirability/sensitive information-As mail surveys, mail panels, and Internet surveys do not involve any social interaction between the interviewer and the respondent, they are the least susceptible to social desirability. Traditional telephone interviews are moderately good at avoiding socially desirable responses. They are good for obtaining sensitive information, as the respondents have the perception that they are not committing to anything in writing over the telephone. E-mail is only moderately good for controlling social desirability and obtaining sensitive information, given the respondents' awareness that their names can be located on the return e-mail. Personal interviews, whether in-home, mall-intercept, or computer-assisted, are limited in this respect.

Potential for interviewer bias - The extent of the interviewer's role determines the potential for bias. In-home and mall-intercept personal interviews are highly susceptible to interviewer bias. Traditional telephone interviews are less susceptible, although the potential is still there. Mail surveys, mail panels, e-mail, and Internet surveys are free of it.

Speed of data collection - The Internet is by far the fastest method followed by e-mail. Traditional telephone interviews are also fast ways of obtaining information. In-home personal interviews are slower, because there is dead time between interviews while the interviewer travels to the next respondent. Mail surveys are typically the slowest. Mail panels are faster than mail surveys, as little follow-up is required.

Cost of data collection - In general, Internet, e-mail, mail surveys, mail panel, traditional telephone, mall-intercept, and personal in-home

interviews require progressively larger field staff and greater supervision and control. Hence, the cost increases in this order.

Non-Structured –Disguised Method

In this type of primary data collection method, the response generated from the study is highly unstructured and the respondents may not know what purpose [disguised] the data have been collected by the researchers. This method is also come under the category of qualitative studies / projective research techniques, where the data collected are of highly unstructured and cannot be analysed using sophisticated statistical methods. Certain methods of observations and projective techniques which include the most popular Thematic Apperception Tests [TAT] are fall under this category.

Observation Method

Certain observation methods are discussed already in the earlier sections in detail. However, there are certain procedures, where the respondents may not aware of the purpose of the data collection.

People meters - It attempts to measure not only the channels to which a television set is tuned, but also who in the household is watching particular programme and time spent on each channel and such other vital information.

Pedestrian turnstiles - In this method, the camera and other censor devices use to record the number of people entering or leaving a certain place – like shopping mall, car parking, bank ATM and so on.

Traffic counters - Certain devices are fitted on toll plaza, airports, and traffic signals to determine the number of vehicles passing certain locations.

On-site cameras - It is used by retailers to assess package designs, counter space, floor displays, and traffic flow patterns. Many firms use to sponsor the video coverage and use to purchase these recordings for a price.

Optical scanners - It allow for mechanized information collection regarding consumer purchases by product category, brand, store type, price, and quantity.

Many observation studies use hidden observation. When this occurs, there are several ethical issues. First, assumption is that the subjects will not be harmed in any way. The purpose of research is research and there should not be any office politics or aspects or pseudo-research associated with observation studies.

Projective Techniques

A projective technique is an indirect means of questioning that enables respondents to express emotions and opinions that would normally be hidden from others and even hidden from themselves. The technique is based on the following assumptions:

- When asked directly, for some questions, the respondent will be reluctant to answer and reveal the truth.
- If they are asked about others (third party) they are more likely to express their true feelings.
- If they are asked an unstructured question with an ambiguous stimulus and given considerable freedom to respond, they come out with true feelings.

Types of Projective Techniques

A good variety of techniques are developed for the purpose of getting responses which respondent may be reluctant to provide if asked directly.

Word Association

- The subject is presented with a list of words, one at a time, and asked to respond with the first word that comes to mind.
- Both verbal and non-verbal responses are recorded.
- Word association should reveal each individual's true feelings about the subject.

- Interpreting the results is difficult; the researcher should avoid subjective interpretations and should consider both what the respondents said and did not say (e.g., hesitations).

Sentence Completion Method

- This technique is also based on the assumption of free association.
- Respondents are required to complete a number of partial sentences with the first word or phrase that comes to mind.
- Answers tend to be more complete than in word association, however, the intention of the study is more apparent.

Third-Person Technique and Role Playing

- Providing a “mask” is the basic idea behind the third-person technique.
- Respondents are asked why a third person does what he or she does, or what a third person thinks of a product.
- The respondent can transfer his attitudes onto the third person.
- Role playing is a dynamic re-enactment of the third-person technique in a given situation.
- This technique requires the subject to act out someone else’s behaviour in a particular setting.

Thematic Apperception Test (TAT)

- This test consists of a series of pictures in which consumers and products are the center of attention.
- The investigator / researcher ask the subject -what is happening in the picture -and what the people will do next.
- Opinion /Theses (“thematic”) are elicited on the basis of the perceptual-interpretive (“apperception”) use of the pictures.
- The researcher then analyses the content of the stories that the subjects relate.
- The picture should present a familiar, interesting, and well-defined problem, but the solution should be ambiguous.

Cartoon tests, or *picture frustration* version of TAT, use a cartoon drawing, in which the respondent fills a dialogue that the cartoon characters might say. Construction techniques request that the consumer draw a picture, construct a collage, or write a short story to express their perceptions or feelings.

Tips to Make Techniques Effective

The use of projective techniques in international marketing research should be carefully considered. Whether verbal or nonverbal stimuli are used, the equivalence of meaning across cultures should be established.

- Establishing the appropriate / equivalent pictures can be particularly problematic.
- Line drawings are subject to fewer problems of interpretation than photographs.
- Techniques which employ verbal cues, such as word association, can be applied with greater degree of comfort by the researchers.

Structured – Disguised Method

In this method of data collection, the respondents do not know what is being measured and hence are not biased in their answers. The advantages of structure lie in the reduction of interviewer and interpreter bias, in quicker and less costly interviewing and in easier tabulation of results.

These kinds of tests are based on the theory that individual's knowledge, perception and memory are conditioned by their attitudes. For example, followers of one political party member listen to more of that party's speeches than listen to their alliance partners. In this method, it is proposed that if respondents are asked questions to which they do not know the answers; they will tend to guess in the direction of their own attitudes.

For example, when the respondents are asked whether various types of people ate hot noodles for breakfast, most respondents reported doctors ate a little of it; office goers ate a lot. This suggests that those respondents thought noodles was not healthful – but glamorous.

Summary

This chapter discussed various method of classifying the primary data sources and analysed the strength and weakness of each of the sources in detail.

Discussion Question

You are a marketing research consultant hired to organize focus groups for an innovative south Indian-Taste fast food restaurant. What kind of people would you select to participate in focus groups? What screening criteria would you use? What questions would you ask?

Mini-Project

Interview 10 persons to know the association of person with brands of tooth pastes. Ask them questions- why are you using a brand? What kind of person are you? What kind of person toothpaste brand is? Is its personality related to the tooth paste brand? Discuss the findings.

Lesson 4.3 - Field Operations

Learning Objectives

- To know how field workers select and train workers.
- To know errors in data processing
- To draft guidelines for interviewers

Introduction

All fieldwork involves the selection, training, and supervision of persons who collect data for the marketing research projects. Many research projects depend upon the support of this field force to a greater degree. Eventually the quality of the research outputs completely depends upon the field workers. The validation of fieldwork and the evaluation of field workers are also parts of the process.

Selection and Training of Interviewers

Researcher has to choose qualified persons as interviewers and train them.

Selection - The first step in the fieldwork process is the selection of field workers. The researcher should:

- Develop job specifications for the project, taking into account the mode of data collection;
- Decide what characteristics the field workers should have; and
- Recruit appropriate individuals.

Interviewers' background characteristics, opinions, perceptions, expectations, and attitudes can affect the responses they elicit.

Training - The training of field workers is critical to the quality of data collected. Training may be conducted in person at a central location or, if the interviewers are geographically dispersed, by mail, video-conferencing, or by using the Internet. Training ensures that all interviewers administer the questionnaire in the same manner so that the data can be collected uniformly.

- ***Making the initial contact*** - This can bring about the successful cooperation of the respondent, who must be convinced that his/her participation is important and that the survey has a legitimate goal. If the respondents feel other way about the research, then the whole results will be highly questionable.
- ***Asking questions*** - Any slight change in the exact wording of a question can distort the meaning intended by the researcher and the uniformity of responses across the sample. The field force should be briefed about the importance of asking the questions exactly as in the questionnaires.
- ***Probing*** - The process of probing motivates respondents to enlarge on or clarify a previous answer in order to extract all information, which is pertinent to the interview. Only by the conscious effort and high degree of involvement, the field force can learn this.
- ***Recording answers*** - Precision in recording answers to both structured and unstructured responses is critical to interpreting consumer responses accurately. The researcher should conduct if required, mock interview process of training the field force.
- ***Terminating the interview*** - The respondent should be left with positive feelings about the interview and the research company should have all the information needed when the interview is terminated. This is very crucial, if you are using snow ball sampling techniques.

Supervision - Supervision of field workers means making sure that they are following the procedures and techniques in which they were trained; thus, resulting in accurately completed surveys that will lead to meaningful analysis. Supervision involves quality control and editing, sampling control, control of cheating, and central office control.

Validation of Fieldwork

Validation of fieldwork means verifying that the field workers are submitting authentic interviews. To validate the study, the supervisors call 10 to 25 percent of the respondents to inquire whether the field workers actually conducted the interviews. The supervisors ask about the length and quality of the interview, reaction to the interviewer, and basic demographic data. The demographic information is cross-checked against the information reported by the interviewers on the questionnaires.

It is important to evaluate field workers to provide them with feedback on their performance as well as to identify the better field workers and build a better, high-quality field force. The evaluation criteria should be clearly communicated to the field workers during their training. The evaluation of field workers should be based on the criteria of cost and time, response rates, quality of interviewing, and quality of data.

Evaluation of Field Force

Field workers must be evaluated so that workers who meet objectives are identified. This will result in a better field force and opportunity to train the poorer workers so that their performance will be improved. Workers should be evaluated in terms of time, response rates, quality of interviewing, and quality of data.

- Cost and Time
 - Total cost per completed interview
 - Total time per completed interview
- Response Rate
 - Percentage of completed interviews over contacts
- Quality of interviewing
 - The appropriateness of the introduction
 - The precision in asking questions
 - Ability to probe without bias
 - Ability to ask sensitive questions
 - Interpersonal skills
 - Manner of terminating the interview

- Quality of data
 - Recorded legibly
 - Followed instructions
 - Verbatim recording of unstructured question responses
 - Meaningful recording of unstructured question responses
 - Low incidence of item non-response

Guidelines for the Interviewers

Most fieldwork suffers from either interviewer error or non-response error. Interviewer errors consist of respondent selection errors, questioning errors, recording errors, and cheating errors. The non-response errors are due to refusals and not-at-homes. During the interview, the interviewers may consider the following guidelines to conduct the process more efficiently and effectively.

- Be thoroughly familiar with the questionnaire; this will create very high trust from the respondents
- Ask the questions in the printed order; do not skip any questions, which will create doubts in the respondents' mind
- Use the exact wording as printed on the questionnaire;
- Read each question slowly according to the respondents requirements
- Repeat questions that are not understood; this will create high quality responses
- Follow instructions related to asking questions carefully
- Ask all questions except those which should be skipped

Errors and Difficulties in Data Processing

The raw data must be subjected to a statistical analysis to render it suitable for further analysis that will result in conclusions about the study. The quality of the statistical inferences may be compromised if adequate attention is not paid to the data preparation phase, resulting in biased findings and incorrect interpretation.

Data cleaning stage occurs after transcribing but before statistically adjusting the data. Cleaning the data refers to a thorough checking of the collected data in order to ensure its reliability. It requires consistency checks and treatment for the missing responses.

Consistency checks comprise of identifying and discarding data which:-

- *are out of range*
- *are logically inconsistent*
- *have extreme values*

Missing responses is another major threat in marketing research projects, which pose problems if their proportion to the total is significant (say, more than 10-20 percent of the total data). The researcher can make use of various alternative courses of actions to remove the missing data problem, which include:

- *substituting a neutral value*
- *substituting an imputed response*
- *case-wise deletion*
- *pair-wise deletion*

One important consideration in the process is that, different procedures for the treatment of missing responses may yield different results; in particular, if the missing responses are located in particular parts of the questionnaire and the variables are related.

Summary

We discussed issues involved in fieldwork; in particular, significance of selection, training, and supervision of persons who collect data for the marketing research projects. Moreover, it has discussed the method to evaluate the field force and set of guidelines to be followed by the interviewers.

Discussion Question

Field operations require lot of control over data collection by investigators- Discuss how controls can be exercised?

Mini-Project

You are a field supervisor. You have to train investigators. How do you conduct training programme ?

Lesson 4.4 - Editing and Coding

Learning Objectives

- To describe process of editing data
- To explain the coding process.

Introduction

Despite the care taken at different stages in data collection, there may be errors and omissions in the data collected. As such, time is to be spent on editing the data obtained. Editing process begins with questionnaire check. Then collected data are to be checked to be take necessary action to ensure completeness in data and proceeding for analysis. To make analysis easy, coding schemes are available. Researchers may employ an appropriate coding method.

Questionnaire Checking

The process of editing has to start with the design of questionnaire.

- Prior to distribution, the questionnaires are checked for completeness and interviewing quality.
- After they have been returned from the field they are again should be screened, to identify the acceptable ones according to established criteria, e.g. completeness, cut-off dates, etc.
- Any problem in meeting the sampling requirements should be identified and necessary corrective action initiated.

During the preliminary checking of the questionnaires, the researcher may identify the following aspects, if present:

- Partially answered questionnaires.
- Pattern of responses that indicate the respondent's lack of understanding of the instructions.

- Responses showing little variance.
- Whether any questionnaire is received after the pre-established cut off date.
- Whether any questionnaire has been answered by an inappropriate person.
- Partially or wholly missing questionnaires.

The acceptable questionnaires, which fulfill all the criteria, are counted by any required quotas or cell groups and care is taken to identify and initiate corrective action if there is any problem in meeting sampling requirements.

The Treatment of Missing Responses

The next stage is treatment of responses. Missing responses are to be filled in some way.

Substitute a Neutral Value - If the mean is substituted for the missing value, the mean of the variable remains unchanged and other statistics, such as correlations, are not affected much. Although this approach has some merit, the logic of substituting a mean value (say 4) for respondents who, if they had answered, might have used either high ratings (6 or 7) or low ratings (1 or 2) is questionable.

Substitute an Imputed Response - This approach requires considerable effort and can introduce serious bias. Sophisticated statistical procedures have been developed to calculate imputed values for missing responses.

Case-wise Deletion - Because many respondents may have some missing responses, this approach could result in a small sample. Throwing away large amounts of data is undesirable, because it is costly and time consuming to collect data. Furthermore, respondents with missing responses could differ from respondents with complete responses in systematic ways. If so, case-wise deletion could seriously bias the results.

Pair-wise Deletion - Different calculations in an analysis may be based on different sample sizes. This procedure may be appropriate when

(1) the sample size is large, (2) there are few missing responses, and (3) the variables are not highly related. Yet, this procedure can produce results that are unappealing or even infeasible.

The different procedures for the treatment of missing responses may yield different results, particularly when the responses are not missing at random and the variables are related. Hence, missing responses should be kept to a minimum. The researcher should carefully consider the implications of the various procedures before selecting a particular method for the treatment of non-response.

Ethical Concerns in Cleaning Data

While checking, editing, coding, transcribing, and cleaning the data, for an experienced market researcher, it is easy to identify those respondents, who did not take the questionnaire seriously or who otherwise provided data of questionable quality. Hence, the researcher has to decide, whether such respondents should be discarded, [not included in the analysis], can raise ethical concerns. A good rule of thumb is to make such decisions during the data preparation phase before conducting any analysis.

In contrast, suppose the researcher neglected this step and conducted the analysis without first attempting to identify unsatisfactory responses. The analysis, however, does not reveal the expected relationship or true relationship. The market researcher then decides to examine the quality of data obtained.

In checking the questionnaires, a few respondents with unsatisfactory data are identified. These respondents are eliminated and the reduced data set analyzed to obtain the expected results. Discarding respondents after analyzing the data raises ethical concerns, particularly if the report does not state that the initial analysis was inconclusive. Moreover, the procedure used to identify unsatisfactory respondents and the number of respondents discarded should be clearly disclosed.

Editing

There are many errors, such as fieldworkers' erroneous recording of responses that must be dealt with before the data can be coded. Editing procedures are conducted to make the data ready for coding and transfer to data storage. Thus, *editing is the process of checking and adjusting the data for omissions, legibility, and consistency*. Various types of editing are dealt in the following sections.

Field editing - Field supervisors are often responsible for conducting preliminary *field editing* on the same day of the interview. If a field edit is conducted at the end of the day, supervisors who edit completed questionnaires will frequently be able to question interviewers, who may be able to remember the interviews and correct the problem. The daily field edit also allows for possible re-contacting of the respondents to fill in omissions.

In-house editing - Field editing or early reviewing of the data is not always possible; sometimes, the study may be conducted on various parts of the country and responses [filled questionnaires] may reach after very days to the central location / research coordinator center. In such situations, *in-house editing* rigorously investigates the results of data collection. The research supplier or the research department normally has a centralized office staff to perform the editing and coding function.

Editing for consistency - The in-house editor's task is to ensure that inconsistent or contradictory responses are adjusted to ensure that the answers will not be a problem for coders and keyboard operators. For example, the editor's task may be to eliminate an obviously incorrect sampling unit. The in-house editor must determine if the answers given by a respondent are consistent with other, related questions—the editor must use good judgment in correcting such inconsistencies.

Editing for completeness - In some cases the respondent may have answered only one portion of a two-part question. *Item non-response* is the technical term for unanswered questions on an otherwise complete questionnaire. Specific decision rules for handling this problem should be meticulously outlined in the editor's instructions. If an editor finds a missing answer where there can be no missing values, he or she may insert an answer (*plug value*) according to such a predetermined rule. Another decision rule might be to randomly select an answer.

The editor must also decide whether an entire questionnaire is “usable.” When a questionnaire has too many missing responses, it may not be suitable for the planned data analysis.

Editing questions answered out of order - Another important decision to be taken by the researcher is to rearrange the answers given to an open-ended question. For example, the respondent may have provided the answer to a subsequent question in his or her comments to an earlier open-ended question. As a result, the interviewer may have avoided asking the subsequent question. To make the responses uniform with other questionnaires, the researcher /editor may move certain answers to the section related to the skipped question.

Editing and tabulating “don’t know” answers - Whenever, the questions are too personal / the research is on unsought goods, in these situations the respondent will prefer to answer “don’t know” option than any other. On the surface, this response seems to suggest “no opinion.” However, there may be reasons other than the legitimate “don’t know” answer. The reluctant “don’t know” is given when an individual simply does not want to answer a question. If the individual does not understand the question, he or she may give a confused “don’t know” answer. The editor may try to identify the meaning of the “don’t know” answer from other data provided on the questionnaire. How the editor deals with such an answer should be based on a systematic procedure.

Pretesting edit - Editing the questionnaires during the pretest stage can prove to be very valuable. For example, certain changes in the questionnaire, such as increasing the space for an open-ended answer because respondents’ answers in the pretest were longer than anticipated, will be appreciated during the actual analysis.

Pitfalls in Editing

The main aim of the editing process is to facilitate the coding process; several editing procedures are specifically designed to simplify the coding process. The editing procedures should not be done on the basis of whims and fancies of the researchers and as systematic as possible with fixed rules lay down very clearly. Often the subjectivity can easily enter into the editing process. To do a proper editing job the editor must

be intelligent, experienced, and objective. A systematic procedure for assessing the questionnaires should be developed.

Coding

Coding is the assignment of categories or classifying symbols to previously edited data. Careful editing makes the coding job easier. When an editor discovers a problem, he or she adjusts the data to make it more complete, consistent, or readable. Coding is an important decision particularly when the research nature involves huge amount of unstructured data collection.

The process of coding starts after editing but before transcribing the data. The coding process consists of assigning of a code (mostly numerical values and occasionally alpha-numeric symbols too, whenever required) to represent a specific response to a specific question along with the data record and column position that the code will occupy in master data chart [often data bases like MS EXCEL, SPSS, SYSTAT etc]. For unstructured questions and open ended questions, it is possible to get a variety of answers; thus, developing unique codes usually follows data collection stage.

Guidelines for Coding

The following points may be kept in mind while editing .

- The researcher has to develop appropriate plan that the entire data should be coded to retain as much of information / or details as possible.
- Mutually exclusive- The researcher should ensure that the category codes determined by him / her be mutually exclusive and collectively exhaustive in nature.
- If there are questions which are permitting multiple responses, each possible response option should be assigned a separate column and codes.
- The respondent code and the record number should appear on each record in the data.

- If needed, additional codes that may be included are project code, interviewer code, date and time codes, and the validation code.
- Fixed field codes are highly desirable. If possible, standard codes should be used for missing data.

Utility of a codebook Coding of questionnaires becomes simple if the codebook is used, because it helps the researcher identify and locate variables. A code book will contain:

Column number	Record number	Variable number
Variable name	Question number	Coding instructions

Procedure for Creating Coding

Sometimes, the researcher may use highly structured questionnaires; but this will not be the case always. When the question has *prior defined and fixed-alternative* (closed-ended) format, the number of categories requiring codes is determined during the questionnaire design stage itself.

When we have fewer alternatives – say 5-7 choices, we use to assign codes “8” and “9” to “don’t know” and “no answer” responses respectively often. Of course, it is only a convention – not a rule.

When a questionnaire is highly structured in nature, the categories may be pre-coded before the data collection process started. In many cases, such as, when the researchers are using open-ended questions, a framework for classifying responses to questions cannot be established before data collection. This situation requires *post-coding*, or simply coding.

Summary

Editing is conducted to make the data ready transfer to data storage. This lesson discussed issues involved in editing and coding.

Discussion Question

You cannot rely on investigators – as their integrity is questionable. You have to monitor, motivate and master mind their activities. Discuss.

Mini-Project

Search and find two research papers discussing issues related to training and monitoring field personnel in research. Based on them, develop a note on field force management.

Lesson 4.5 - Data Analysis and Hypothesis Testing

Learning Objectives

- To introduce data analysis methods like frequencies, cross tabulation
- To discuss the significance of measures of central tendencies
- To introduce various concepts related to hypothesis testing

Introduction

Researchers use hypothesis to provide direction for data collection along with the research objectives. Hypotheses are tested for their validity. For this several hypothesis testing techniques are developed and used by researchers. In this chapter, we will deal with data analysis methods and hypothesis testing procedures.

Preliminary Data Analysis

Preliminary data analysis refers to application of simple procedures that enable the researcher to get a feel for the data. This allows the researcher to understand the basic relationships among variables so that, he can further do a rigorous analysis of the data, in a focused way. The interpretations and insights gained during the initial data analysis are sometimes very useful in clarifying the results obtained from further analyses.

For better applications of statistical tools and selection of a data analysis strategy, the researcher may consider the following aspects:

Objectives and hypotheses - The preliminary data analysis strategy prepared as a part of the research design and the process will be including problem definition, development of an approach, and research design may serve as a starting point. However, modifications should be done in light of the additional information generated.

Known characteristics of the data - The scales of measurement (nominal, ordinal, interval, or ratio) and the nature of the research design strongly influence the choice of a statistical technique. For example, techniques like ANOVA are highly suited for analyzing experimental data from causal designs.

Properties of statistical techniques - The statistical techniques serve varying purposes and some techniques are more robust to the violations of the underlying assumptions as compared to the others. Thus, depending on the applications (e.g. examining differences in the variables, making predictions) appropriate statistical techniques should be chosen.

Background and philosophy of the researcher - Depending on their sophistication, researchers employ various statistical methods and make different assumptions about the variables and underlying populations. For example, a conservative researcher may choose only those statistical techniques that are distribution free.

Descriptive Statistics

It presents the data in terms of percentages or averages as well as variances.

Simple Tabulation

Tabulation of the data refers to an orderly arrangement of data collected by the researcher in a table or other summary format. Counting the number of responses to a question and putting them into a frequency distribution is a simple tabulation, or marginal tabulation. It is also referred to as *frequency table*.

In addition to frequency counts, percentages, and cumulative percentages associated with the variable are also given. Moreover, this frequency table can be used to draw inferences about the central tendency, variability, or shape of the underlying distribution. Table shows a simple table

From Table, it is obvious that the most people preferred brand is Diet Pepsi, as 50% of respondents have expressed their preference.

Preferred brands

(N = 500)

Brand	Frequency	Percentages
Brand - Pepsi	125	25
Brand-Diet Pepsi	250	50
Brand-Coke	125	25
	Total	100

Cross Tabulation - Simple tabulation may not yield the full value of the research. Most data can be further organized in a variety of ways. Analyzing results by groups, categories, or classes is the technique of cross-tabulation. The purpose of categorization and cross-tabulation is to allow the inspection and comparison of differences among groups. This form of analysis also helps determine the type of relationship among variables.

Percentage cross-tabulation: The total number of respondents or observations may be used as a **base** for computing the percentage in each cell. Selecting either the row percentages or the column percentages will emphasize a particular comparison or distribution.

There is a conventional ruling for determining the direction of percentages if the researcher has identified which variable is the independent variable and which is the dependent variable. The margin total of the independent variable should be used as the base for computing the percentages.

However, due to the increase in complexity, three variables cross-tabulation is seldom used. For example, a popular coffee restaurant in Bangalore city observed inflow of customers on a randomly selected day. The data have been collected and summarized in Table.

From the table, it is evident, nearly 75% of the female customers prefer after 7 PM; whereas only 3.5% of male customers prefer after 10 PM. The restaurant has to provide appropriate measures to protect the interest of female customers.

Preference to visit coffee shop

			Preferable time to visit Coffee shop					Total
			10-12 pm	12-3 pm	3-7 pm	7-10 pm	after 10	
Gender of the respondents	Male	Count	11	3	40	57	4	115
		Expected Count	6.9	2.9	32.8	45.4	27.0	115.0
	Female	Count	1	2	17	22	43	85
		Expected Count	5.1	2.1	24.2	33.6	20.0	85.0
Total		Count	12	5	57	79	47	200

Measures of Central Tendencies

Among the various tools, most often used measures are mean, mode, and median. The mean is the average of the responses, the mode is the most commonly given response, and the median is the middle value of the data when data are arranged in an ascending or descending order. Data must be at least interval scaled in order to calculate the mean, but only ordinal for the median and nominal for the mode.

The simple mean or average is probably the most commonly used method of describing central tendency. To compute the mean all you do is add up all the values and divide by the number of values. For example, the mean or average score of a cricketer in the recent 20-20 format is determined by summing all the scores and dividing by the number of matches he played.

For example, consider the match score of a batsman in the last 10 matches;

11, 16, 21, 21, 20, 34, 15, 25, 15, 22

The sum of these 10 values is 200, so the mean is $200/10 = 20$.

In notation, $\bar{X} = \sum [X_i/N]$ $i- 1, 2, 3 \dots N$

The Median is the value, which exactly divide the data into two parts; that is, the middle of the set of values. One way to compute the

median is to list all scores in numerical order, and then locate the score in the center of the sample. If we order the batsman scores [10 items], shown above, [11, 16, 21, 21, 20, 34, 15, 25, 15, 22], we would get:

11, 15, 15, 16, 20, 21, 21, 22, 25, 34

Since there are 10 items, item-5 and item-6 divide the data into two equal parts. Therefore, median is simple average of item-5 &6.

$$\text{Median} = 20+21/2 = 20.5$$

If we have only 9 items, for example, [11, 16, 21, 21, 20, 15, 25, 15, **and 22**], then, we would get:

11, 15, 15, 16, 20, 21, 21, 22, 25

Since there are 9 items, item-5 divides the data into two equal parts. Therefore, median is simply the 5th entry, which is nothing but 20.
Median = 20

The mode is the most frequently occurring value in the set of scores. To determine the mode, you might again order the scores as shown above, and then count each one. The most frequently occurring value is the mode. In our example, the value 15 occurs two times and 21 occurred twice; therefore, the distribution has bi-modal values. In some distributions there is more than one modal value. Those distributions are known as Multi-modal distributions; one should note that a distribution need not have unique mode or multi-modes.

Hypothesis Testing Procedure

Hypothesis is a statement of expected result. It is an unproven proposition or supposition that tentatively explains certain facts or phenomenon. It is for testing and proving.

The process of hypothesis testing goes as follows:

Step-1 State Null Hypothesis

A null hypothesis is a statement about a status quo. It is often denoted by H_0

Step-2 State Alternative Hypothesis

The alternative hypothesis states the opposite of the null hypothesis. The symbol H_1 denotes it.

Step-3 Determine the Significance Level

Statisticians have defined the decision criterion as the significance level. The significance level is a critical probability in choosing between the null hypothesis and the alternative hypothesis. The level of significance determines the probability level—say, .05 or .01—that is to be considered. The researcher in a way decides “how much” he or she is willing to bet. More appropriately, the researcher selects the odds of making an “incorrect” decision. Some gamblers will take an 80 percent chance; others, more conservative, will take 99 percent. By convention, 95 percent is often utilized.

Step-4 Choose an Appropriate Test

If the data is nominal and the hypothesis seeks to test associations, use chi-square. If the data is ordinal and seeks to examine rank correlations, use rank correlation tests. If it is means of two samples, use t test. If it seeks to examine variances, use ANOVA. Likewise, based on the data, select an appropriate test.

Step-5 State the Decision Rule

It tells when to accept null hypothesis or reject it. Find the table value of the test statistic for the degrees of freedom and significance level. In general, when computed value is greater than table value, we reject null hypothesis.

Step-6 Compute the z Statistic

Use the appropriate formula, make necessary calculations and find the value of the test statistic.

Step-7 Make Decision

Compare computed value with critical value and take decision as per laid out rule.

Step-8 Make Inferences

Draw final conclusion based on the result.

Illustrative Case

The Red Chicken restaurant is concerned about its store image, one aspect of which is the friendliness of the service. In a personal interview, customers are asked to indicate their perception of the service on a 5-point scale, where 1 indicates very friendly and 5 indicates very unfriendly. The scale is assumed to be an interval scale and the distribution of the service variable is assumed to be normal.

Step-1 Null Hypothesis

The researcher formulates the null hypothesis that the population mean is equal to 3.0:

$$H_0: \mu = 3.0$$

Step-2 Alternative hypothesis

The alternative hypothesis is that the mean does not equal 3.0:

$$H_1: \mu \neq 3.0$$

Step-3 Significance Level

The researchers have set the significance level at the .05 level. This means that in the long run the probability of making an erroneous decision when H_0 is true will be fewer than five times in 100.

Step-4 Choose an Appropriate Test

The Red Lion hired research consultants who collected a sample of 225 interviews. The mean score on the 5-point scale was 3.78. The sample standard deviation was $S = 1.5$. They decided to use t test.

Step-5 State the Decision Rule

From the tables of standardized normal distribution, the researcher finds that the Z score of 1.96 represented a probability of .025 that a sample mean will lay above 1.96 standard errors from μ . Likewise .025 of all sample means will fall below -1.96 standard errors from μ . The values that lie exactly on the boundary of the region of rejection are called the critical values of μ . The sample mean is greater than the critical value, 3.196, the researchers say that the sample result is statistically significant beyond the .05 level.

Decision rule: Reject null hypothesis if computed value Z is greater than 3.196 (critical value obtained from tables).

Step-6 Compute the Critical Value

Now we must transform these critical Z-values to the sampling distribution of the mean for this study. The critical values are:

$$\begin{aligned} &= \mu \pm ZS_{\bar{x}} \text{ or } \mu \pm Z (S / \sqrt{n}) = 3.0 \pm 1.96 (1.5 / \sqrt{255}) \\ &= 3.0 \pm 1.96 (.1) = 3.0 \pm 1.96 \end{aligned}$$

Lower limit= 2.804 and Upper limit= 3.196

Step-7 Make Decision

The sample mean $\bar{X} = 3.78$. is greater than the critical value, 3.196. , Hence, the sample result is statistically significant beyond the .05 level. Therefore, null hypothesis is rejected. The alternative hypothesis is accepted.

Step-8 Make Inferences

The results indicate that customers believe the service is friendly. It is unlikely (less than five in 100) that this result would occur because of random sampling error.

Type I and Type II Errors

The researcher runs the risk of committing two types of errors.

A **Type I error**, which has the probability **alpha** (α)—the level of significance that we have set up—is an error caused by the rejection of the null hypothesis when it is true. A

Type II error has the probability of **beta** (β) and it is an error caused by the failure to reject the null hypothesis when the alternative hypothesis is true.

Without increasing the sample size the researcher cannot simultaneously reduce Type I and Type II errors because there is an inverse relationship between the two (i.e., $1-\alpha=\beta$). Thus, reducing the probability of a Type I error increases the probability of a Type II error and vice versa. In marketing problems, Type I errors are generally more serious than Type II errors.

The number of variables that will be simultaneously investigated is a primary consideration in the choice of statistical techniques.

Summary

The preliminary data analysis strategy prepared as a part of the research design and the process will be including problem definition, development of an approach, and research design may serve as a starting point. This lesson introduces preliminary data analysis and concepts related to hypothesis testing.

Discussion Question

There are actually two main approaches to doing a hypothesis test. The most commonly used in today's technological era, is the p-value approach. The other approach, is the classical approach (which finds critical values). Are they different? Discuss.

Mini-Project

Collect 5 research articles which have used different tests for testing hypothesis. Study them and prepare a note on hypothesis testing.

Lesson 4.6 - Hypothesis Testing Methods

Learning objectives

- To explain different tests and their application

Introduction

The purpose of statistical inference is to draw conclusions about a population on the basis of data obtained from a sample of that population. Hypothesis testing is the process used to evaluate the strength of evidence from the sample and provides a framework for making determinations related to the population. It provides a method for understanding how reliably one can extrapolate observed findings in a sample under study to the larger population from which the sample was drawn. The investigator formulates a specific hypothesis, evaluates data from the sample, and uses these data to decide whether they support the specific hypothesis.

Student t-test

In situations where the sample size is small ($n \leq 30$) and the population standard deviation is unknown, we use the **t-distribution**. The t-distribution is a symmetrical, bell-shaped distribution with a mean of zero and a unit standard deviation. The shape of the t-distribution is influenced by its **degrees of freedom**. The number of degrees of freedom (d.f.) is equal to the number of observations minus the number of constraints or assumptions needed to calculate a statistical term.

The step-by-step procedure for a t-test is given here:

Step 1—State the null hypothesis and the alternative hypothesis

Step 2—the researcher must calculate \bar{x} , S and estimate the standard error of the mean using the formula

$$S_x = S / \sqrt{n}$$

Step 3—The researcher must find the t value associated with the desired level of significance.

Step 4—He or she must formulate a decision rule specifying the critical values by computing the upper and lower limits of the confidence interval to define the regions of rejection.

Step 5—The researcher makes the statistical decision by determining if the sample falls between the critical limits.

To calculate the statistic, 't' distribution uses the formula:

$$t = \frac{\bar{X} - \mu}{S_{\bar{x}}} \quad \text{With } n - 1 \text{ degrees of freedom}$$

If the population standard deviation σ is known, then the Z distribution is appropriate regardless of sample size. However, when σ are unknown and the sample size is less than 30 then the t-distribution should be used.

Example

Suppose a business organization was interested in how long newly hired MBA's remain on their first job. On the basis of a small sample of MBA's (17), the researcher wishes to estimate the population mean with 95 percent confidence. The data from the sample indicates a sample mean, \bar{X} , of 3.7 years with a sample deviation $S = 2.66$.

To find the confidence estimates of the population mean for this small sample,

$$\mu = \bar{X} \pm t_{c,1} S_{\bar{x}}$$

or

$$\mu = \bar{X} \pm t_{c,1} S / \sqrt{n}$$

Where μ = population mean

\bar{X} = sample mean

$t_{c,1}$ = critical value of t at a specified confidence level

$S_{\bar{x}}$ = standard error of the mean

S = sample standard deviation

n = sample size

In the example about the MBA students, we know $\bar{X} = 3.7$, $S = 2.66$, and $n = 17$.

To calculate the confidence interval, we must go to Student-T distribution table, and look under 16 degrees of freedom ($n - 1$, $17 - 1 = 16$) for the t value at the 95 percent confidence level. In this case $t = 2.12$.

Hence, Upper limit = $3.7 + 2.12(2.66 / \sqrt{17}) = 5.07$ and Lower limit = $3.7 - 2.12(2.66 / \sqrt{17}) = 2.33$.

It may be concluded with 95 percent confidence that the population mean for the number of years spent on the first job by MBAs is between 5.07 and 2.33 years.

CHI-SQUARE Test for Goodness of Fit

The **chi-square X^2 test** allows us to test for significance in the analysis of frequency distributions. For example, we wish to test the null hypothesis that the number of consumers aware of a certain tire brand equals the number unaware of the brand. The logic inherent in the X^2 test allows us to compare the observed frequencies (O_i) with the expected frequencies (E_i). It tests the “goodness of fit” of the observed distribution with the expected distribution.

The steps in the process are as follows:

- Formulate the null hypothesis, and determine the expected frequency of each answer.
- Determine the appropriate significance level.
- Calculate the X^2 value using the observed and expected frequencies from the sample.
- Make the statistical decision by comparing the calculated value with the critical value.

To calculate the chi-square statistic, the following formula is used:

$$X^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where χ^2 = chi-square statistic
 O_i = observed frequency in the i th cell
 E_i = expected frequency in the i th cell

The degree of freedom refers to the number of observations that can be varied without changing the constraints or assumptions associated with a numerical system. Degrees of freedom (d.f.) = $k - 1$, where k = the number of cells associated with column or row data. In the brand awareness problem degrees of freedom equals 1 (d.f. = $2 - 1 = 1$).

Finally, the computed chi-square value needs to be compared with the critical chi-square values associated with the .05 probability level with one degree of freedom. In Chi-Square Table, for the 1 degree of freedom, the critical chi-square value is 3.84.

Test of Proportions

The population proportion (Π) can be estimated on the basis of the sample proportion (p). The method of testing a hypothesis about a proportion is conceptually similar to hypothesis testing when the mean is the characteristic of interest. However, the formulation of the standard error of the proportion is mathematically different.

Even though a population proportion is unknown, a large sample allows the use of the Z-test. Using the following formula, we can calculate the observed value of Z, given a certain sample proportion:

$$Z_{\text{obs}} = \frac{p - \Pi}{S_p}$$

Where p = sample proportion
 Π = hypothesized population proportion
 S_p = estimate of the standard error of the proportion

When the sample size is small, the Z-test is not appropriate and the t-test should be used.

Where = population proportion of group 1
= population proportion of group 2

The comparison between the observed sample proportions p_1 and p_2 allows the researcher to ask whether the differences from two large random samples occurred due to chance alone.

To test a Z-test statistic we use the following formula:

$$Z = \frac{(P_1 - P_2) - (\Pi_1 - \Pi_2)}{S_{p_1 - p_2}}$$

Where p_1 = sample proportion of successes in group 1

p_2 = sample proportion of successes in group 2

$\Pi_1 - \Pi_2$ = hypothesized population proportion 1 minus hypothesized proportion 2

$S_{p_1 - p_2}$ = a pooled estimate of the standard error of differences in proportions $S_{p_1 - p_2}$

Correlation Analysis

A correlation is a single number that describes the degree of relationship between any two variables, which are measured either interval or ratio scales.

The formula for the correlation is:

$$r = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{[N\Sigma x^2 - (\Sigma x)^2][N\Sigma y^2 - (\Sigma y)^2]}}$$

Where:

- N = number of pairs of scores
- Σxy = sum of the products of paired scores
- Σx = sum of x scores
- Σy = sum of y scores
- Σx^2 = sum of squared x scores
- Σy^2 = sum of squared y scores

We use the symbol r to stand for the correlation and it will always be between -1.0 and +1.0. If the correlation is negative, we have a negative relationship; if it is positive, the relationship is positive.

Consider the following research question: Is there any relationship between two variables, height (in inches) and self esteem?

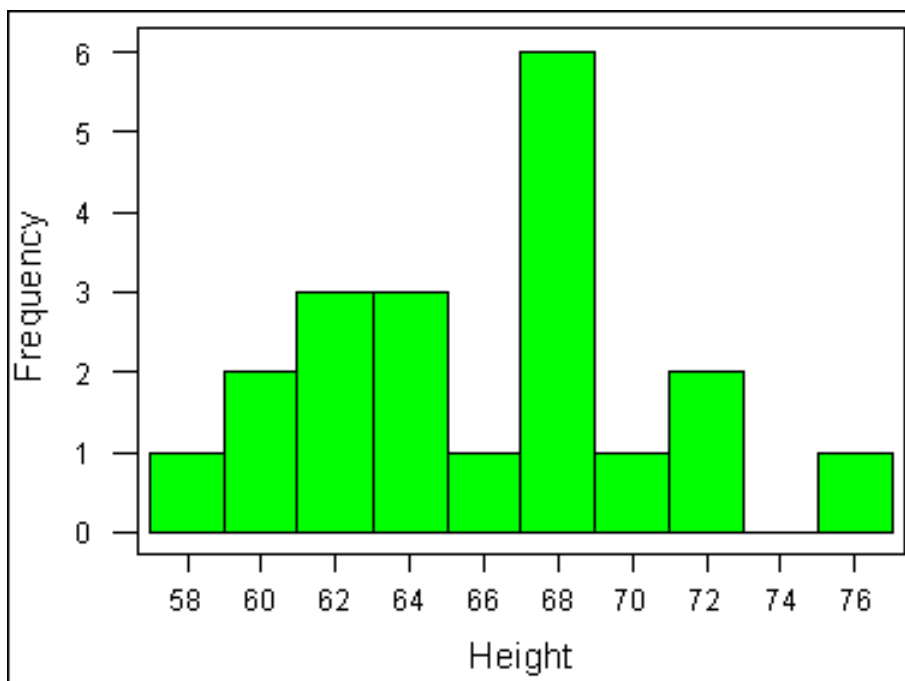
Null hypothesis- Height and self esteem are not related.

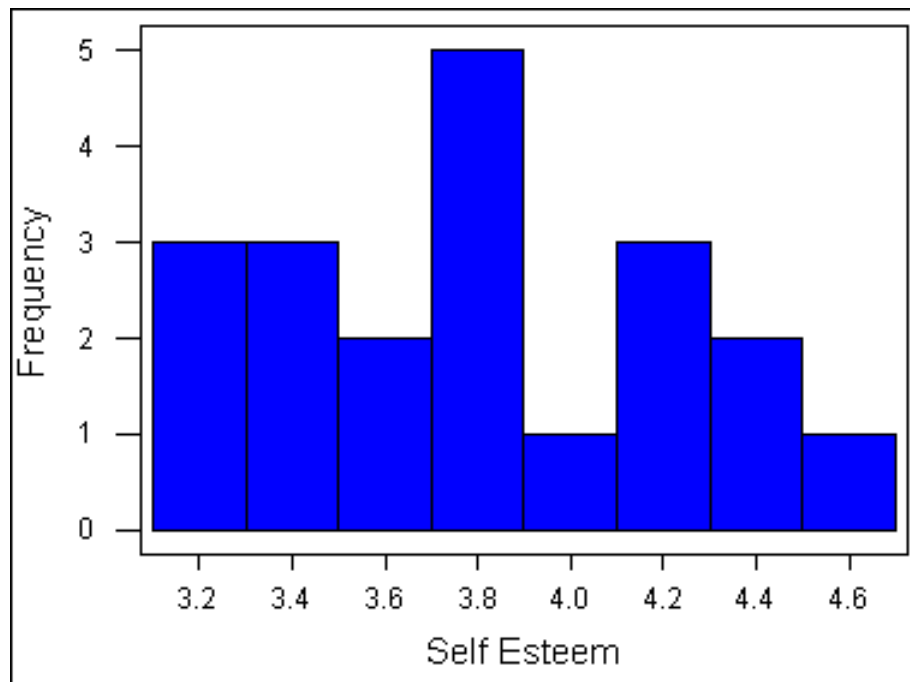
Alternative hypothesis- - Height and self esteem are related.

Height is measured in inches. Self esteem is measured based on the average of 10 1-to-5 rating items (where higher scores mean higher self esteem). The following table summarizes the data collected from 20 respondents.

Per-son	Height	Self Esteem	Per-son	Height	Self Esteem	Per-son	Height	Self Esteem
1	68	4.1	8	68	4.1	15	60	3.4
2	71	4.6	9	71	4.3	16	63	4.0
3	62	3.8	10	69	3.7	17	65	4.1
4	75	4.4	11	68	3.5	18	67	3.8
5	58	3.2	12	67	3.2	19	63	3.4
6	60	3.1	13	63	3.7	20	61	3.6
7	67	3.8	14	62	3.3			

The following is the histogram / bar chart representation of the each variable:

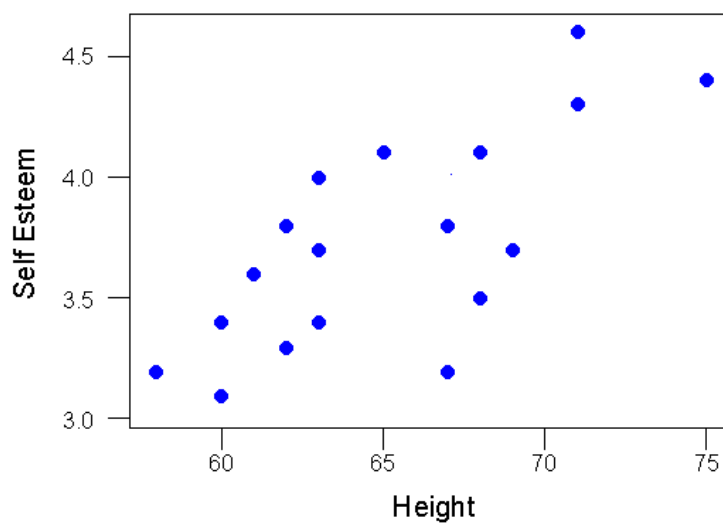




And, here are the descriptive statistics:

Variable	Mean	SD	Variance	Sum	Minimum	Maximum	Range
Height	65.4	4.40574	19.4105	1308	58	75	17
Self Esteem	3.755	0.426090	0.181553	75.1	3.1	4.6	1.5

In addition, the scatter plot of these two variables is given below:



By seeing the graph, one should immediately guess that the relationship between the variables is a positive one, because if you were to fit a single straight line through the dots it would have a positive slope or move up from left to right.

Person	Height (x)	Self Esteem (y)	x*y	x*x	y*y
1	68	4.1	278.8	4624	16.81
2	71	4.6	326.6	5041	21.16
3	62	3.8	235.6	3844	14.44
4	75	4.4	330	5625	19.36
5	58	3.2	185.6	3364	10.24
6	60	3.1	186	3600	9.61
7	67	3.8	254.6	4489	14.44
8	68	4.1	278.8	4624	16.81
9	71	4.3	305.3	5041	18.49
10	69	3.7	255.3	4761	13.69
11	68	3.5	238	4624	12.25
12	67	3.2	214.4	4489	10.24
13	63	3.7	233.1	3969	13.69
14	62	3.3	204.6	3844	10.89
15	60	3.4	204	3600	11.56
16	63	4	252	3969	16
17	65	4.1	266.5	4225	16.81
18	67	3.8	254.6	4489	14.44
19	63	3.4	214.2	3969	11.56
20	61	3.6	219.6	3721	12.96
Sum =	1308	75.1	4937.6	85912	285.45

The first three columns are the same as in the table above. The next three columns are simple computations based on the height and self esteem data. The bottom row consists of the sum of each column. This is all the information we need to compute the correlation. Here are the values from the bottom row of the table (where N is 20 people) as they are related to the symbols in the formula:

$$\begin{aligned}
 N &= 20 \\
 \Sigma xy &= 4937.6 \\
 \Sigma x &= 1308 \\
 \Sigma y &= 75.1 \\
 \Sigma x^2 &= 85912 \\
 \Sigma y^2 &= 285.45
 \end{aligned}$$

Now, when we substitute these values into the formula given above, we get the following:

$$r = \frac{20(4937.6) - (1308)(75.1)}{\sqrt{[20(85912) - (1308*1308)][20(285.45) - (75.1*75.1)]}}$$

$$r = \frac{98752 - 98230.8}{\sqrt{[1718240 - 1710864][5709 - 5640.01]}}$$

$$r = \frac{521.2}{\sqrt{[7376][68.99]}}$$

$$r = \frac{521.2}{\sqrt{508870.2}}$$

$$r = \frac{521.2}{713.3514}$$

$$r = .73$$

The correlation coefficient is 0.73, which indicates a fairly strong positive relationship

For testing its significance, let us use the significance level of $\alpha = .05$.

Degrees of freedom = $N-2$. In this example, $df = 20-2 = 18$.

I will opt for the two-tailed test. I look up in tables and find that the critical value is 0.4438. This means that if my correlation is greater than 0.4438 or less than -0.4438 (remember, this is a two-tailed test) I can conclude that the odds are less than 5 out of 100 that this is a chance occurrence. Since my correlation of 0.73 is actually quite a bit higher, I conclude that it is not a chance finding and that the correlation is "statistically significant" (given the parameters of the test). I can reject the null hypothesis and accept the alternative.

Regression Analysis

Regression is another technique for measuring the linear association between a dependent and an independent variable. Regression analysis assumes the dependent (or criterion) variable, Y, is predictively or “causally” linked to the independent (or predictor) variable, X. It investigates a straight-line relationship of the type $Y = a + \beta X$, where Y is the dependent variable, X is the independent variable, and ‘a’ and β are two constants to be estimated. The symbol a represents the Y intercept, and β is the slope β coefficient. The slope is the change in Y due to the change in one unit of X.

Regression analysis attempts to predict the values of a continuous, interval-scaled dependent variable from the specific values of the independent variable. Forecasting of sales is by far the most common application of regression analysis.

Least-Squares Method - The *least-squares method* is a relatively simple mathematical technique that ensures that the straight line will be the most representative of the relationship between X and Y. Any straight line drawn will generate errors, but the method of least-squares uses the criterion of attempting to make the least amount of total error in prediction of Y from X. The sum of squared deviations of the actual values from this predicted regression line. Using the symbol e to represent the deviations of the dots from the line, the least-squares criterion is as follows:

$$\sum_{i=1}^n e_i^2 \text{ is minimum}$$

Where $e = Y_i - \hat{Y}_i$ (the “residual”)

Y_i = actual value of the dependent variable

\hat{Y}_i = estimated value of the dependent variable (Y “hat”)

n = number of observations

i = number of the observation

The general equation for a straight line is $Y = a + \beta X$ where a more appropriate estimating equation includes an allowance for error: $Y = \hat{a} + \hat{\beta} X + e$

Coefficient of determination: The strength of association is measured by the coefficient of determination denoted by r^2 . It varies between 0 and 1 and signifies the proportion of the total variation in Y that is accounted for by the variation in X.

't' statistic. A t statistic with $n-2$ degrees of freedom can be used to test the significance of b value. $H_0: \beta_1 = 0$, where $t = \frac{b}{SEb}$

Example- 1 The sales of Ramaraj company are given under. Estimate demand in 8th month

Month	1	2	3	4	5	6	7
Sales in (Rs)	20	22	25	28	32	33	36

Solution

Period	X	Y	X ²	XY
1	1	20	1	20
2	2	22	4	44
3	3	25	9	75
4	4	28	16	112
5	5	32	25	160
6	6	33	36	178
7	7	36	49	252
sum	28	196	140	841
Mean	X=4	Y=28		

slope $b = \frac{\sum XY - N X_m Y_m}{\sum X^2 - N (X_m)^2}$

Where Y_m and X_m represent the mean value of X and Y distribution.

The intercept $a = Y_m - b X_m$

The value of $b = \frac{(7 \times 841) - (28 \times 196)}{(7 \times 140) - (28)^2}$

$$= \frac{(5887 - 5488)}{(980 - 784)} = \frac{399}{196} = 2.04$$

The value of $a = 28 - (2.04 \times 4) = 19.84$

$$Y = 2.04 X + 19.84$$

Coefficient of determination (r^2) can be computed as follows

Period	X	Y	$Y - Y_m$	$[Y - Y_m]^2$	Y_c	$Y - Y_c$	$[Y - Y_c]^2$
1	1	20	-8	64	21.88	1.88	3.5
2	2	22	-6	36	23.92	1.92	3.7
3	3	25	-3	9	25.96	0.96	0.9
4	4	28	0	0	28	0	0
5	5	32	4	16	30.04	1.96	3.8
6	6	33	5	25	32.08	-.92	0.8
7	7	36	8	64	34.12	1.88	3.5
sum	28	196		214		7.52	16.2
Mean	X=4	Y=28					

Y_c values are computed using $Y = 2.04X + 19.84$

Coefficient of determination = $r^2 = [214 - 16.2] / 214.62 = 0.924$

It shows that 92.4% of total variation observed in dependent variable is explained by the equation. To test it for statistical significance, we proceed as follows.

$H_0 = r^2 = 0$ and $H_1 = r^2 \neq 0$ significance level $\alpha = 0.01$

Equation for computing $t = r \sqrt{[(n-2)/(1-r^2)]}$ for $n-2$ degrees of freedom

Since $n = 7$ and $r^2 = 0.924$ we get $t = \sqrt{5/0.076} = 8.11$

The table value of t for 5 degrees of freedom for $\alpha = 0.01$ for two tailed test is 4.032

As computed value is larger than critical value, reject null hypothesis.

The alternative hypothesis is accepted. Coefficient of determination is significant.

Analysis of Variance (ANOVA)

When the means of more than two groups or populations are to be compared, one-way *analysis of variance (ANOVA)* is the appropriate statistical tool. Analysis of variance involves the investigation of the effects of one treatment variable on an interval-scaled dependent variable. It is a hypothesis testing technique to determine if statistically significant differences on means occur between two or more groups.

An example of an ANOVA problem might be to compare women who are working full time outside the home, working part time outside the home, or working full time inside the home on their willingness to purchase a microwave oven. Here there is one independent variable—working status—but there are three groups (levels) and therefore a t-test cannot be used for the testing of statistical significance.

The null hypothesis in such a test is that all the means are equal—that is, $\mu_1 = \mu_2 = \mu_3$

To test the null hypothesis of no difference between the sample variances, a table of the F-distribution is necessary. In the F-test there will be two forms of variation:

- (1) Variation of scores due to random error or within-group variation due to individual differences (within-group variance)
- (2) Systematic variation of scores between the groups as the result of the manipulation of an independent variable or due to characteristics of the independent variable (between-group variance).

The F-distribution is the ratio of these two sources of variances.

$$F = \frac{\text{Variance between groups}}{\text{Variance within groups}}$$

If the F value is large, the results are statistically significant.

Total sum of squares = Within-group sum of squares + Between-group sum of squares

$$\text{Or } SS_{\text{total}} = SS_{\text{within}} + SS_{\text{between}}$$

The total sum of squares, or SS_{total} , is computed by squaring the deviation of each score from the grand mean and summing these squares.

SS_{within} , the variability that we observe within each group, is calculated by squaring the deviation of each score from its group mean and summing these scores (see the chapter for formula).

SS_{between} , which is the variability of the group means about a grand mean, is calculated by squaring the deviation of each mean from the grand mean, multiplying by the number of items in the group, and summing these scores (see the chapter for formula).

The next calculation requires dividing the various sums of squares by their appropriate degrees of freedom. The results of these divisions produce the variances, or mean squares.

To obtain the mean square between the groups, SS_{between} is divided by $c - 1$ degrees of freedom, and to obtain the mean square within the groups, SS_{within} is divided by $cn - c$ degrees of freedom.

Finally, the F ratio is calculated by taking the ratio of the mean square between groups to the mean square within groups: $F = \frac{MS_{\text{between}}}{MS_{\text{within}}}$

There will be $c - 1$ degrees of freedom in the numerator and $cn - c$ degrees of freedom in the denominator.

Assumptions - The assumptions made are:

- 1) Categories of the independent variable are fixed (fixed-effect model) or a mixture of both (mixed effects model).
- 2) The error term is normally distributed with a zero mean and a constant variance.
- 3) The error terms are uncorrelated.

Step – by Step Process

The researcher must first identify the dependent and independent variables. The null hypothesis that the category means are equal can then be formulated as:

$$H_0: \mu_1 = \mu_2 = \mu_3 = \dots = \mu_c$$

If Y is the dependent variable, X the factor having c categories, and there are n observations on Y for each category of X , then the total sample size is $N = n \times c$.

The total variation in Y , denoted by SS_y , can be decomposed into the variation attributable to the independent variable and the variation not attributable to the independent variables.

This is expressed as $SS_y = SS_{\text{between}} + SS_{\text{within}} = SS_x + SS_{\text{error}}$

$$SS_y = \sum_{i=1}^N (Y_i - \bar{Y})^2 \quad SS_x = \sum_{i=1}^c (Y_i - \bar{Y})^2 \quad SS_{\text{error}} = \sum_{i=1}^c \sum_{j=1}^n (Y_{ij} - \bar{Y}_j)^2$$

Where, y_i = individual observation of Y y_{ij} = i^{th} observation in j^{th} category

\bar{Y}_j = mean for category j \bar{Y} = grand mean.

The strength of the effects of X on Y are measured by:

$$\eta^2 = SS_x/SS_y = (SS_y - SS_{\text{error}})/SS_y \quad 0 < \eta^2 < 1$$

The null hypothesis is tested by the F -statistic:

$$F = \frac{SS_x/(c-1)}{SS_{\text{error}}/(N-c)} = \frac{MS_x}{MS_{\text{error}}}$$

Which follows the F distribution with $(c - 1)$ and $(N - c)$ degrees of freedom. If the null hypothesis is not rejected, then the independent variable does not have a significant effect on the dependent variable. If it is rejected, then it does have a significant effect on the dependent variable. Interpretation flows from the results of the F test. If the null hypothesis is not rejected, then we may not conclude that X had any effect on Y . If H_0 is rejected, then X has an impact on Y . This impact may be determined by examining the mean value for each category.

Summary

We gave an introduction about the role of 't' distribution in marketing research and discussed the procedure for developing interval estimate. The use of Univariate hypothesis testing using 't' distribution is explained and role of Chi-square goodness of fit and proportion test are discussed. We discussed briefly correlation and managerial applications of correlation; followed by correlation, there is a discussion on regression and One-way Analysis of Variance

Discussion Question

The general idea in testing hypotheses is to ask: Is there some other universe which might well have produced the observed sample? So we consider alternative hypotheses. This is a straightforward exercise in probability, asking about behavior of one or more universes. The choice of another universe(s) to examine depends upon purposes and other considerations.- Discuss.

Mini-Project

Find one research article for each test discussed in the lesson and prepare a note on the application of the tests for testing of hypotheses.

Lesson 4.7 - Multivariate Data Analysis

Learning Objectives

- Explain the procedure involved in factor analysis
- Describe the method of cluster analysis and conjoint analysis

Introduction

The information age has resulted in masses of data in every field. Despite the quantum of data available, the ability to obtain a clear picture of what is going on and make intelligent decisions is a challenge. Researchers have started using models that represent a situation in which, decision involves more than a single variable to represent reality. Multivariate Data Analysis refers to any statistical technique used to analyze data that arises from more than one variable. Multivariate Analysis can be used to process the information in a meaningful fashion.

Factor Analysis

The general purpose of factor analysis is to summarize the information contained in the large number of variables into a smaller number of factors. Factor analysis refers to a diverse number of techniques used to discern the underlying dimensions or regularity in phenomena. If a researcher has a set of variables and suspects that these variables are interrelated in a complex fashion, then factor analysis may be used to untangle the linear relationships into their separate patterns.

Consider the following example. A researcher has conducted a study of mutual funds taking a sample of 240 investors. He asked how far the 11 qualities are important for them. The respondents were supplied with a 5 point rating scale and the response are computed in terms of mean and SD and shown in

Fund related qualities (N=240)

S.No	Qualities	Mean	SD	Importance
1	Fund performance record	4.44	0.81	Important
2	Funds reputation or brand name	4.27	0.79	Important
3	Scheme' s expense ratio	4.06	0.98	Important
4	Scheme' s portfolio of investment	4.07	0.77	Important
5	Reputation of the Fund Manager/ scheme	4.14	0.92	Important
6	Withdrawal facilities	4.10	0.89	Important
7	Favourable rating by a rating agency	4.04	0.89	Important
8	Innovativeness of the scheme	3.94	1.05	Important
9	Products with tax benefits	4.19	0.90	Important
10	Entry & Exit load	3.92	1.00	Important
11	Minimum initial investment	4.26	0.92	Important

Scale 5 - Highly important 1-Not at all important

To have better understanding of the data, factor analysis is conducted. From the Table it is clear that the approximate chi-square statistic is 259.008 with 55 degrees of freedom which is significant at 0.05 levels. The KMO statistic (0.553) is also large (>0.5). Hence factor analysis is considered as an appropriate technique for further analysis of data.

On the basis of Varimax Rotation with Kaiser Normalisation, 5 factors have emerged. From Table it is found that five factors are explaining about 64% of the variance. Each factor is constituted of all those variables that have factor loadings greater than or equal to 0.5 as shown in Table. The factors are named as given under.

Factor – 1 is labeled as “Extrinsic fund qualities”. It comprised three items: Scheme’s expense ratio, Reputation of the Fund Manager/ scheme and Products with tax benefits

Factor - 2 is called “Intrinsic fund qualities” It consisted of three 3 items: Favourable rating by a rating agency, Innovativeness of the scheme, and Minimum initial investment

Factor - 3 is termed as “Flexibility”and it is made up of two items: Withdrawal facilities and Entry & Exit load

Factor - 4 named as “Performance” and it has two items - Fund performance record and Funds reputation or brand name

Factor - 5 is labeled as “Portfolio management” and it has only one item- Scheme’s portfolio of investment.

All the five factors are important as they have items which are rated important with a mean score around 4.

KMO and Bartlett’s Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.553
Bartlett’s Test of Sphericity	Approx. Chi-Square	259.008
	Df	55
	Sig.	0

Factor loadings: The *factor loadings* are roughly analogous to the correlation of the original variables with the factor. Each factor loading is a measure of the importance of the variable in measuring each factor. Inspection of the factor loading table indicates that for each of the variables loading on the factor (factor 1), the loadings are much higher on factor 1 than on factors 2 and 3.

Total variance explained: a table portrays a percentage of total variance of the original variable as explained by each factor. This explanation of variance is equivalent to the R² in multiple regressions.

Factor score: Factor analysis procedures derive factor scores, which represent each observation’s calculated value or score on each of the factors. The factor score will represent an individual’s combined response to the several variables representing the factor.

Communality: It is a measure of the percentage of a variable’s variation that is explained by the factors. A relatively high communality indicates that a variable has much in common with other variables taken as a group.

The term rotation is important in factor analysis. Solutions to factor analysis problems may be portrayed by geometrically plotting the values of each variable for all respondents or observations. Geometric axes may be drawn to represent each factor. New solutions, geometrically, are represented by rotation of these axes. Hence, a new solution with fewer or more factors is called a rotation.

Total Variance Explained

Component	Initial Eigen values		Extraction Sums of Squared Loadings		Rotation Sums of Squared Loadings		Cumulative %	% of Variance	Cumulative %
	Total	% of Variance	Total	% of Variance	Total	% of Variance			
1	2.12	19.274	2.12	19.274	1.766	16.051	19.274	16.051	16.051
2	1.477	13.432	1.477	13.432	1.575	14.314	32.705	30.364	30.364
3	1.22	11.094	1.22	11.094	1.297	11.791	43.799	42.156	42.156
4	1.154	10.49	1.154	10.49	1.268	11.526	54.289	53.682	53.682
5	1.074	9.766	1.074	9.766	1.141	10.373	64.055	64.055	64.055
6	0.919	8.357							
7	0.726	6.599							
8	0.7	6.366							
9	0.621	5.642							
10	0.557	5.063							
11	0.431	3.917					100		

Extraction Method: Principal component Analysis

Rotated Component Matrix-factor loadings

S. No	Qualities	Component				
		1	2	3	4	5
1	Fund performance record			0.115	0.715	0.343
2	Funds reputation or brand name			-0.11	0.842	-0.18
3	Scheme' s expense ratio	0.714	-0.157	0.123		0.195
4	Scheme' s portfolio of investment	0.167	0.142			0.835
5	Reputation of the Fund Manager / Scheme	0.631	0.122	0.204	0.174	
6	Withdrawal facilities	0.433		0.547		
7	Favourable rating by a rating agency	0.163	0.796	-0.12		0.189
8	Innovativeness of the scheme	-0.35	0.646	0.371		
9	Products with tax benefits	0.657	0.345	-0.245		
10	Entry & Exit load		0.127	0.815		
11	Minimum initial investment	0.234	0.565	0.19		-0.453

Cluster Analysis

Cluster analysis is used to classify objects or cases into relatively homogeneous groups. A cluster should have high internal (within-cluster) homogeneity and external (between-cluster) heterogeneity. Cluster analysis facilitates market segmentation by identifying subjects or individuals who have similar needs, life-styles, or responses to marketing strategies. It describes; it does not predict relationships.

Cluster analysis has many applications to marketing. Some of them are listed here.

- 1) Segmenting the market—clusters of consumers can be created based on common characteristics

- 2) Understanding consumer behavior—clusters of consumers can be created based on psychographic characteristics. For example, international vacationers form three clusters: “demanders,” “educationalists,” and “escapists.”
- 3) Selecting test markets—cities can be grouped into homogeneous clusters to select test markets.
- 5) Reducing data—to make data analysis more manageable, clusters can be used as the unit of analysis in multivariate analysis.

Procedure

Cluster analysis is a complex procedure requiring careful detail in implementation.

Formulating the problem—Select relevant variables is based on past research, theory, and hypotheses formulated for testing. Inclusion of irrelevant variables distorts the clustering solution.

Selecting a distance or similarity measure—Choose some measures like Euclidean distance or its square (most popular), Manhattan distance, and Chebychev distance. The length of the distance between two objects indicates the degree of similarity between them.

Selecting a clustering procedure—Procedures can be classified as hierarchical or non-hierarchical. Hierarchical methods develop a tree structure in determining clusters and non-hierarchical do not.

Hierarchical methods- Agglomerative methods, a hierarchical procedure, are commonly used. They consist of linkage methods, variance methods, and centroid methods. The average linkage method is preferred to the single or complete linkage methods because it uses information on all pairs of distances. Of the hierarchical methods, average linkage and Ward’s methods have been shown to perform better than the other procedures.

Non-hierarchical methods -. When a large number of subjects are to be clustered, non-hierarchical methods are preferred due to their speed. However, here the number of clusters has to be pre-specified and

the selection of the cluster center is arbitrary. This affects the clustering results.

Hierarchical and non-hierarchical methods may be used in tandem. The choice of a clustering method is interrelated with the choice of a distance measure. Icicle plots and dendrograms are useful in displaying results.

Deciding on the number of clusters—No firm rules exist, but guidelines on this issue

Include the following :

- Theoretical, conceptual, or practical considerations may suggest a certain number of clusters.
- In hierarchical clustering, the distances at which the clusters are being combined are an important criterion. Icicle diagrams, dendrograms, and agglomeration schedules can be useful here.
- In nonhierarchical clustering, the ratio of total within-group variance to between-group variance can be plotted against the number of clusters. The point at which an elbow or a sharp bend occurs indicates an appropriate number of clusters. Increasing the number of clusters beyond this point is usually not worthwhile.
- The relative sizes of the clusters should be meaningful. It is not meaningful to have a cluster with only one case, so a three-cluster solution is preferable in this situation.

Interpreting and profiling the clusters—The clusters should be interpreted in terms of cluster centroids. Often it is helpful to profile the clusters in terms of additional variables that were not used for clustering.

19.5 Conjoint Analysis—It involves having consumers evaluate products as bundles of attributes and provide information about the relative importance or tradeoffs value of each attribute. Such data are typically obtained using a non-disguised questioning approach (e.g., having respondents allocate the points contained in a constant sum scale to each attribute, thereby providing a ranking of importance). If conjoint measurement is involved, then a disguised method is used to evaluate

alternative products. The process consists of obtaining rank-order reactions to products where all their attributes are described—or, where sets of partial products (incomplete statements of attributes) are judged, two attributes at a time.

Summary

Multivariate data analysis is a class of highly complex set of tools – but very useful in managerial applications. In this lesson, we briefly discussed the role of factor analysis, cluster analysis and conjoint analysis.

Lesson 4.8 - Report Writing and Presentation

Learning Objectives

- To know the contents of a report
- To describe how quality reports can be prepared

Introduction

Report provides a documentary evidence of research work and explains the problem definition, approach, research design, fieldwork, and the results of data analysis and interpretation. Reports are the tangible products of the research effort. They serve as a historical record of the project. In general researchers prepare a written report and make an oral presentation of the results. After the client has read the report, any follow-up considerations or research will be addressed.

Content of a Report

Though the report formats to vary with the researcher, the client, and the nature of the research project, a common framework can be designed for writing the reports. A typical report may contain the following items:

Prefatory pages - Title page, Letter of transmittal, Letter of authorization, Table of contents, List of tables, List of graphs, List of exhibits, List of appendices and.

Executive summary - Major findings, Conclusions and Recommendations.

Body of the Report

- Problem definition - Background to the problem, Statement of the problem, Approach to the problem

- Research design - Information needs , Data collection from primary sources , Scaling techniques, Questionnaire development and pretesting , Sampling techniques and field work, Data analysis – Methodology - Plan of data analysis
- Findings – data analysis – results- inferences - Limitations and caveats- Conclusions and recommendations

Supplements – Exhibits, Questionnaire and format, statistical output and Lists

Title page: It includes the title of the report, information (like name, address and telephone) related to the researcher or the firm doing the research, the client, and the date of release.

Table of contents: It is based on the outline of the report and lists the sequence of topics included with the corresponding page numbers. In most reports, only the major headings and subheadings are included in the table of contents. The table of contents should be followed by the lists of tables, graphs, appendices, and exhibits.

Executive summary: This is the most important section in a research report and often read by everyone in the organization. It is difficult for managers to get time to read entire report. Therefore, the researcher must present the information in such a way as to allow the manager to quickly understand the basic findings of the report in order to make decisions.

Mostly, it is devoted to present in brief the conclusions, and recommendations and the Research approach and major results,

Problem definition: This section contains a statement of the management decision problem and the marketing research problem. It also states the background to the problem, highlighting the discussions with the decision-maker(s) and industry experts. It also mentions the secondary data analysis, the preliminary research that was conducted, and the factors that were considered. After reading this part, you should be in a position to understand why and how the research work has been taken.

Research design: This section details the nature of the research design adopted, the information needs, data collection methods, scaling techniques, questionnaire development and pretesting, sampling techniques, and fieldwork. The material is presented in nontechnical terms and the technical details are included in the appendix. This section also justifies the procedures adopted. This is the proof that how a researcher has scientifically structured his research work.

Data analysis: This section describes the plan of data analysis, justifying the selection of the specific techniques. The data analysis techniques are described in simple, nontechnical terms.

Conclusions and recommendations: This section contains the inferences derived from the marketing research results and states the feasible and practical recommendations that can be used by the client for its own decision-making purposes.

Report Preparation Guidelines

In spite of the importance attached to the report, often many researchers use to overlook the importance of report and commit very trivial mistakes. Written report problems include the following:

- **Organization** - Various sections of the report are badly organized; Lack of headings and subheadings to show the organization of the report.
- **Communication** - Paragraphs that are too long, multi-topic expositions rather than short, clearly focused presentations; too much dependence on traditional essay style rather than the more telegraphic research reporting style;; mistakes in spellings; padding of the report with extra verbiage.
- **Design** - Badly designed tables, charts, and graphics; overloaded Tables, Failure to locate charts and tables contiguous to the first reference to them; too small margins and too little white space
- **Commitment** - Failure to revise, believing the first draft is the only draft; Assignment of sections of report to different writers, making for uneven writing

The following guidelines will be helpful in preparing a quality report.

- **Reach out to the reader:** The report should reach out to the target audience. This can be done by taking into account the client's technical sophistication, interest in the project, and the circumstances or manner in which they are going to read and use it.
- **Ease of comprehension:** The report should be easy to follow. Clarity, brevity, and logical structuring of the presented material increases the ability to comprehend the report. A well-structured report will be highly logical in nature and organization.
- **Presentable and professional appearance:** An appealing and inviting appearance brought through skilful use of typing, binding, and reproducing can entice the reader and enhance his desire to read the report.
- **Objectivity:** The report should be truthful and sincere in purpose. Any deviation from this destroys the credibility of both the report and the researcher.
- **Reinforcement:** Reinforcement of the information in the text through visual aids facilitates communication with the reader and adds to the impact of the report.
- **Terseness:** Brevity in the presentation of a report, without sacrificing completeness, adds to its appeal.
- **Effective use of Graphic representation** - Use properly, various graphic aids can clarify complex points or emphasize a message. Several types of graphic aids may be useful in research reports.
 - *Tables* - They are most useful for presenting numerical information. Each table should include a table number, which allows simple reference from the text, a title, a box head and stub head, footnotes, and a source note.
 - *Charts* - They translate numerical information into visual form so that relationships can be easily grasped. Each chart should include a figure number, allowing easy reference from the text, a title, an explanation of the chart, and a source and footnotes.

- *Pie charts* - One of the most useful types of charts is the pie chart. A pie chart shows the composition of some total quantity at a particular time. Each angle or “slice” is proportional to its percentage of the whole and should be labelled with its description and percentage. Do not try to include too many slices—about six slices is a usual maximum.
- *Line graphs*- They are useful to show the relationship of one variable to another. The dependent variable is generally shown on the vertical axis and the independent variable on the horizontal axis.
- *Bar charts*- They show changes in the dependent variable at discrete intervals of the independent variable. Common variants are the subdivided bar chart or the multiple bar charts. In each of these cases, each variable needs to be clearly identified.

Presentation and Follow-Up

The research work may be used by using power point slides. The slides should be neatly formatted containing information highlights rather than elaborate descriptions. Avoid too much graphical designs; they distract listeners.

Assisting the client and evaluating the research project activities are expected from the researcher during the follow up stage of the research work.

Assisting the Client

- Clarifying difficulties in understanding the report
- Assisting in implementation of the findings.
- Identifying any other research projects that need to be undertaken.

Evaluating the Research Project

- Identify the difficulties faced in doing the market research project in question.
- Identify the shortcomings, if any, associated with the different stages of the entire market research project.

- Think of the possible impact if alternative methodology was followed at different steps, like data-collection, data analysis, report writing, presentation, etc.

The insights gained from such an evaluation would benefit not only the researcher, but also the subsequent projects conducted.

Ethical Concerns

In a research report preparation, the major concerns deal with accuracy, objectivity, and integrity. For example, the Marketing Research Association's code of ethics includes these two commitments:

“To exercise all reasonable care and to observe the best standards of objectivity and accuracy in the development, collection, processing, and reporting of marketing and survey research information” and

“To make available to clients such details on the research method and techniques of an assignment as may be reasonably required for proper interpretation of the data, providing this reporting does not violate the confidence of respondents or clients.”

The methodology and results should be honest rather than slanted to a particular point of view or the needs of the client requirements. The proper information should be reported.

Confidential information should remain confidential and not be made public. Negative findings should not be omitted just because it makes the company or a manager look bad.

Summary

The report preparation is significant deliverable from the research work and viewed as most important by the decision makers. There is a discussion on content of a standard research report and various guidelines to be followed and various ethical issues in preparing a report

Discussion Question

Research report writing is a balancing activity. The complexity in analysis and findings are to be simplified for better understanding, without losing meaning and dimensions of analysis- Discuss.

Mini-Project

Visit library and find two doctoral theses. Examine their structure, style and graphical presentations.

Self Assessment Questions

1. Explain the data collection on –line data collection methods
2. What are the important considerations in web questionnaire design?
3. Discuss the use of the Internet and computers in designing questionnaires?
4. To discuss the importance of secondary data and identify various sources of secondary data
5. To develop a classification scheme for secondary data sources
6. To discuss the merits and demerits of secondary data sources
7. Explain the need for primary data collection. How do you classify primary data collection methods?
8. What are the methods of survey research? What are its merits and demerits?
9. Describe focus groups in detail with an emphasis on planning and conducting focus groups, and their advantages, disadvantages, and applications?
10. Describe depth interview techniques in detail citing their advantages, disadvantages, and applications
11. Explain projective techniques in detail and compare association, completion, construction, and expressive techniques?
12. Describe the process of designing a questionnaire, the steps

involved, and guidelines that must be followed at each step

13. Describe the evaluation of field workers in areas of cost and time, response rates, quality of interviewing, and the quality of data?
14. Discuss the supervision of field workers in terms of quality control and editing, sampling control, control of cheating, and central office control?
15. Discuss the training of field workers in making the initial contact, asking the questions, probing, recording the answers, and terminating the interview?
16. State the purpose and methodology for each statistical data adjustment technique?
17. Describe the factors influencing the selection of a data analysis strategy?
18. Explain simple tabulation with a suitable example..
19. What is hypothesis? What do you understand by Null and alternative hypotheses.
20. What do you mean by Type I and Type II errors?
21. Explain with an example chi-square test procedure.
22. Write a short note on correlation
23. Describe the application of regression analysis
24. Describe one-way analysis of variance
25. Discuss the need for report preparation
26. Describe the contents of a research report
27. What are the common problems in report writing?

CASE STUDY

Ad Campaign in DLF IPL III

The advertising agency wishes to determine their new ad campaign developed could be launched through the **SONY MAX**® TV programme “**DLF IPL - III**” and whether it will reach the target consumers. Mr. Sriram, a trainee research executive in the ad agency obtained IMRB research report on the consumption pattern of the packaged cereal foods, in the state of Tamil Nadu. This report was prepared about nine months ago. The consumption pattern categorised on income basis is given in Exhibit-1. You will observe that out of the statewide sample of 4000 households, 45% (1800 out of 4000) fall in the target group.

Mr. Sriram, through another report, collected the addresses of 600 households (in the city of Chennai) for whom “**DLF IPL - III**” is a favourite Programme. Among these households, the agency conducted a survey to find out the consumption pattern of packaged cereal food. The findings are in Exhibit-2. Mr. Sriram recommended that the advertisement be inserted in “**DLF IPL - III**” program because 48% of the sample (288 out of 600) are in the target group. The marketing manager of MFC had following comment to make.

“Mr. Sriram, the statewide consumption pattern reveals that 45% of the people are in the target group (Medium to high income and moderate to heavy consumption). In the city survey, just 48% fall in the target group. In other words, with or without TV ad, the target audience is in the range 45% to 48%. Are the households which prefer “**DLF IPL - III**” significantly different from the state as a whole? Unless the city data is significantly different from statewide data, there is no point in spending money in TV ad.”

Mr. Sriram, went back to his office, concluded his seniors and presented an analysis to figure out if there is a statistical significance between the two sets of data and to clarify marketing manager’s doubts.

Questions: What do you think Mr. Sriram did to justify his recommendation?

*Packaged cereal food consumption by household income
statewide sample of 4000*

	House Hold Income			
	Low	Medium	High	Total
Heavy consumers	100	500	200	800
Moderate consumers	200	700	400	1300
Light consumers	500	450	100	1050
Non users	400	350	100	850
Total	1200	2000	800	4000

*Packaged cereal food consumption by household income
(City sample of 600 whose favourite is "DLF IPL - III")*

	House Hold Income			
	Low	Medium	High	Total
Heavy consumers	36	68	50	154
Moderate consumers	24	90	80	194
Light consumers	22	62	52	136
Non users	20	52	44	116
Total	102	272	226	600

Case study prepared by R. Venkatesakumar (March 2010) for class room discussions. Cases are developed solely as the basis for class discussion and are not intended to serve as endorsements, sources of primary data or illustration of effective or ineffective management.

UNIT - V

Unit Structure

Lesson 5.1 - Product and Motivation Research

Lesson 5.2 - Advertising Research

Lesson 5.3 - Sales Control Research

Lesson 5.4 - Rural Marketing Research

Lesson 5.5 - Export Market Research

Lesson 5.1 - Product and Motivation Research

Learning Objectives

- To describe the role of marketing research in product decisions.
- To examine the application of marketing research in new product development
- To explain the importance of motivation research
- To identify methods of conducting of motivation research

Introduction

The single most important strategy of any firm is the development of a product line which meets the needs of certain groups of consumers. . Though several new products are launched every year, a majority of them fail. Some may succeed initially, but face decline very fast. Only small proportion of new products is successful. A report by the leading marketing research firm AC Nielsen states that the success rate of 35% is observed for the new products. The success of a marketing plan depends on consumer motives to buy. As such motivation research is of great significance for extending product life cycle.

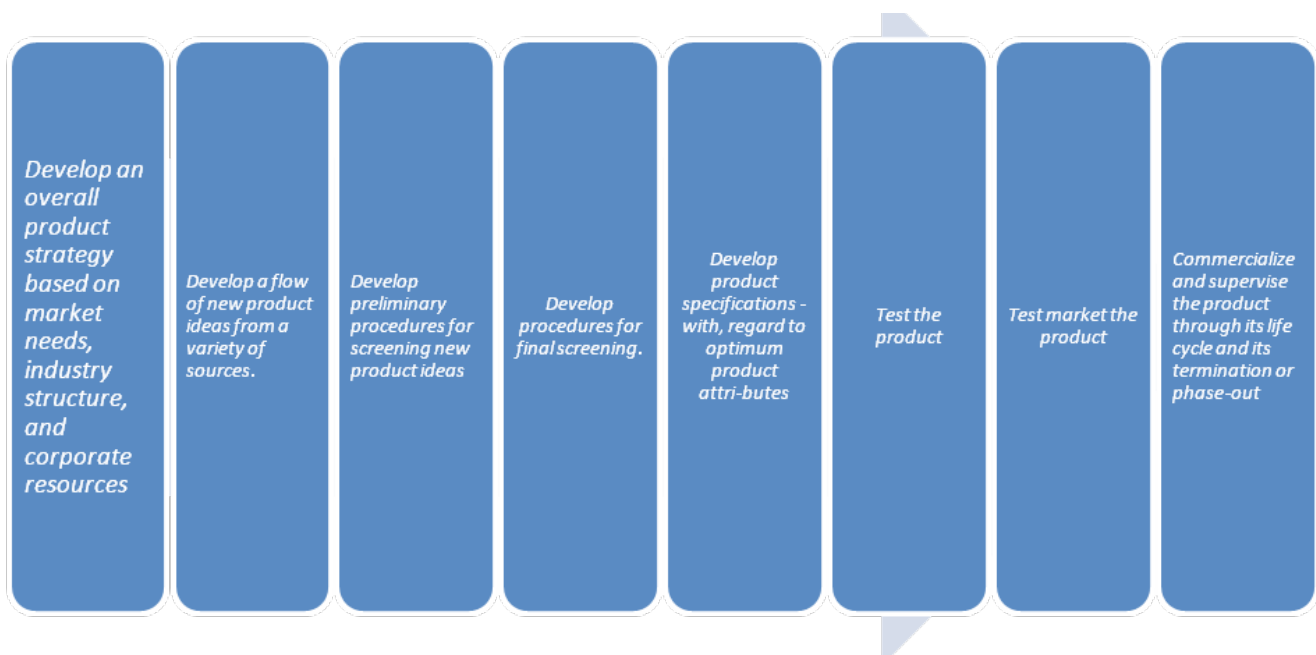
Product Strategy and Marketing Research

Product strategy decisions relate to innovation, product mix, product line and product item developments. Product tactics refer to matching product in terms of attributes and functions with those of competitors and excelling them. In view, of the need for taking short term and long term decisions, marketer need information on the following

- **Market developments** – consumer research, competition research and channel research
- **Product developments** – process innovations, technology developments, and international product developments, innovative ideas from different sources, etc.

New Product Development Process

The essence of any firm's new product policy is the identification of those product opportunities that will generate, over a stated time period, the greatest return on the funds invested in relation to the risk involved, and that are compatible with the firm's resources. To attain the above objectives it is necessary to take the following steps:



New Product Development Process

Table examines the role of marketing research in each of the stages of product development.

Marketing research and product development

Stage	Information needs	Role of research
Overall product strategy	Market needs, industry structure, and corporate resources.	Market studies – consumer needs and demand forecasts. SWOT analysis
New product ideas	Market needs – current and future, competitor strategies, technology developments	Competitors' innovation strategies. Consumer research, sales force research, channel research. Foreign products and performance analysis, and Technology research
Screening new product ideas	Feasibility – operational, economic, financial and technical.	Concept testing, sampling research, panel research. Open source idea generation and evaluation
Product design	Optimum product attributes.(design for sell, design for function, design for manufacturing)	Consumer surveys, Channel interviews,
Test market the product	Consumer acceptance , channel acceptance	Focus groups, panel research, sample distribution and surveys. Sales wave analysis. Trial and repeat buying.
Launch of the product	Markets to be preferred, channel decisions.	Market analysis, distribution research,
Life cycle management	Sales and profits data, competitor data	Sales research, cost analysis, innovations analysis, competition analysis etc.

Product development -Idea to Design

It is necessary to determine that set of product attributes that are optimum for the market segment(s) to which the product will appeal. At the very minimum, marketing research should provide information pertaining to what features must be included in the product and the level and relative importance of each (the ideal brand). It should also report on how consumers rate products or brands now on the market and different versions of the new product against the ideal brand. Saliency measures of product attributes—both individually and in combinations—are critical to the design of the product, to the need to position it properly in the marketplace, and to the estimate of demand.

Methods - Measures can be obtained on a variety of new product proposals using pictures or drawings, models or prototypes, or advertisements that describe the benefits provided by the product's features. Such research is often referred to as concept research and is useful in determining how prospective customers evaluate a proposed new product's attributes in light of the benefits claimed.

Useful data relating to product attribute preferences can be obtained by using paired comparison tests, rank orders, rating scales, or statements concerned with likes and dislikes. From such tests the percentage of consumers who prefer each "level" of the product attribute is estimated. These preference ratings can be compared with consumer preferences for the company's and competitors' existing products. Thus, such an approach enables management to gain insights as to what extent new products may outperform existing products, as well as to define relevant market segments.

Self-Reporting is one method which requires consumers to specify which product attributes most influence their preferences. The advantage of this type of preference model is that it is easy to use— and inexpensive. Generally speaking, it is most useful early in the design work or when the consumer choice process is relatively simple, as would be the case with frequently purchased products.

Product Testing

Management will, of course, test the product intensively in the laboratory whenever it is possible to simulate real world usage conditions.

Lab tests - This is particularly true for products that can be submitted to lab tests to determine reliability and performance over time.

Field tests - For some industrial goods, it is feasible to have customers try the product under a set of specified conditions. It must be remembered that real-world tests are designed primarily to determine whether the product's physical attributes lead to satisfaction and preference.

Panel tests - Another way to test new products is through the use of a panel of experts. This is often the case with foods where experts evaluate "taste" and "aroma" to make sure the new product lives up to its

benefits-offered claims. In other cases different recipes can be tested to determine which is best. The advantage of such tests is their relatively low cost and the speed with which they can be done. The problem is that the experts may not accurately reflect the views of the actual consumers.

Blind paired comparison tests - When the new product is designed to replace an existing one, either of the firm or of competitors, blind paired-comparison tests (where the consumer does not know the brands involved) can be employed. Consumers who are members of the target market are asked to use both products and then to choose the one they like most. The simplest type of paired comparison test is that in which the respondents are given the test product in an unidentified package and asked to try it and to compare it with the product they have been using. Such a test is not usually a satisfactory one because respondents tend to vote in favor of the unknown brand. This may be a result of the respondent's desire to please the researcher or of the respondent's assumptions that the new product must be better. In any case, biased results are likely to be obtained.

A better approach is to have respondents try two "masked" products under similar use conditions for a time period. The interviewer then returns to get a preference rating and to find out what attributes were liked or disliked in each product.

Staggered Comparison Tests: Such tests are similar to the side-by-side comparison tests discussed above; but they differ in that respondents use one product first and then, either days or weeks later, try the second product. The identities of the two products are masked. One half of the respondents receive product A first and the other half receive product B first. Such a split is necessary to avoid a "tried last" bias. Staggered comparison tests have many of the disadvantages of the paired comparison tests, but in theory they better replicate the actual market since customers usually buy one product at a time instead of two different brands of the same product at one time. In practice, however, there is little difference in the results obtained by the two tests.

Disguised Comparison Method: This type of study attempts more nearly to duplicate actual market conditions in the test situation without actually being a sales test. A specific example will illustrate the method. Respondents were given a "pair" of products packaged in exactly the same

fashion. The respondents had no reason to believe any difference existed between the two. Respondents were asked to use the products, but they were not told that any future interviewing would be done. They had no reason to think that they were participating in any kind of product test. Probably, they thought of the products as free samples. Approximately two weeks after the respondents received the free merchandise; an interviewer called and conducted a disguised type of interview with the respondents about their experiences, if any, with the products. First, the interviewer ascertained whether both packages had been used. Following this, the respondents were given several opportunities to indicate whether any differences had been noted. If no differences were volunteered, non-disguised questions on differences were asked.

Laboratory Test Markets One low-cost alternative to traditional test marketing is the laboratory test market. For packaged consumer products, the procedure typically consists of a simulated supermarket, where respondents buy products under controlled conditions, and of auditorium-like facilities, where respondents are exposed to advertisements and other promotional materials. Separate samples of consumers are used if more than one “treatment” (e.g., different prices or copy themes) are involved. Respondents in each sample are “representative” of the target audience and participate in the following:

1. Respondents are asked to complete a self-administered questionnaire concerned with their individual demographics and purchase behavior relative to the product class of interest. About 300-400 respondents are exposed to a TV program containing a number of communications about brands in the product class including one for the brand being tested.
2. Respondents visit the simulated store, which is stocked with the brands shown in the commercials and with any others of importance. Respondents are provided with a fixed amount of money and told to purchase the brand they choose.
3. After purchase, small groups of respondents are engaged in focused discussions concerning reasons for their purchase. Following this, the respondents return home.
4. Sometime later, respondents are re-interviewed by phone to determine reactions to the product purchased, including satisfaction

or dissatisfaction, usage data, repurchase, and comparisons with other brands used.

5. If an extended usage test is involved, then respondents are given the opportunity to repurchase the test brand, which, if requested, is then delivered to them. Step 4 is then repeated at a later date.

With longer follow-up periods, more repurchase situations can be analyzed, which increases the accuracy of the test results. The above process assumes that the consumer's behavior throughout the test is "realistic" because she was forced to pay money for both the initial and repeat purchases. Even so, laboratory test market models are not without their problems. No matter the safeguards used in attempting to control the environment properly, realism can never be totally assured.

Industrial goods can be tested in a number of ways, including trade shows, in-use situations, and sales presentations. The first method consists of displaying and demonstrating the product to obtain measures of interest and possible buying intentions. In-use tests place the product with a sample of potential buyers who agree to try it and to provide an evaluation of its performance. Sales demonstrations simply present the product to a sample of prospective customers in an effort to learn how many would purchase it.

Pretest market forecasts for consumer durables can be obtained from laboratory research in much the same way as discussed above.

Pretest market research methods. While they are no substitute for test marketing, can provide important diagnostic information about a new product and its likelihood of success faster than a full-scale test, and at a lower cost. Pretest market research methods have been used primarily for frequently purchased consumer products but have been adapted—with some degree of success—for use with consumer durables and industrial products. While the more successful methods are primarily concerned with predicting the test product's share potential, they also provide information that will help improve the product and its advertising.

Test Marketing. Test marketing is a procedure by which a company attempts to test on a small basis the commercial viability of a new product. Such a test has a twofold purpose: it is designed (1) to provide a reasonable

estimate of the sales and profit potentials in the new product, and (2) to help management identify and correct any problems having to do with the marketing plan and the product before making the final commitment a full-scale introduction. The following points are important for conducting test marketing effectively.

- The company must first develop its national marketing plan for the new product and then replicate it in miniature for the test
- The ultimate objective of any market test is to obtain an estimate of sales for at least the first year of national operation for some level of promotional expenditure.
- Select the right test markets. (i) It has consumers who have matured to use the product. It should be “normal” regarding the historical development of the product class involved. (ii) Not too small or not too large. Small markets may not give reliable results. Large one makes the test expensive. (iii) It should have interest in new products. It should not be the one which is over tested. (iv) It should be representative of large national market (planned for the actual marketing) in terms of media, distribution etc. Several commercial research firms (e.g., Nielsen) maintain a number of test markets for their clients.
- Different levels of advertising intensity can also be tried and their effect on sales measured. The critical point here is that no strategy should be tested unless it is part of one or more national marketing plans. It should also be noted that the more variables to be tested, the more difficult and expensive the test marketing will be.
- The sales estimates are obtained by measuring the rate at which consumers are induced to try the new product and the number of consumers making repeat purchases.
- The test should last long enough to permit buyers who have purchased the product once to make at least three (and possibly four) repurchases. The heart of any sales estimate lies in the measurement of repeat purchases

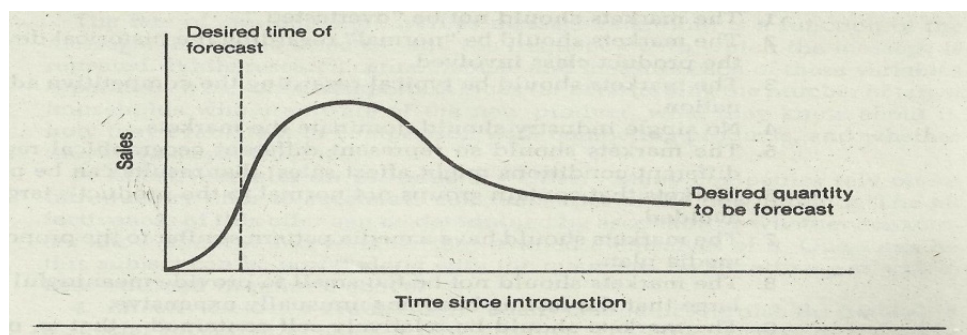
Deciding What to Measure: Researcher may measure a number of variables as given in Table.

Test market results

S.No	Aspect	Measures
1	Repeat Purchasing	Number of repeat purchases in total sales
2	Advertising effectiveness	Number of consumers aware, Number of consumers who recall
3	Introductory offer	Percentage aware of the offer, Percentage liked the offer Percentage motivated to buy
4	Trade offer	Sales force report analysis on number of retailers responded positively
5	Sales	Share of total market, volume of unit sales and rupee sales
6	Consumers	Characteristics” of households, buying (i.e., who are the heavy buyers?), innovation adoption etc. Unwilling consumers and their characteristics.

Forecasting sales - The difficulty in forecasting future sales lies in the fact that the demand for a new product typically raises rapidly, then peaks and declines to a lower level. The reason for this is that many more consumers try the product than eventually adopt it; the challenge is to “look beyond” the hump in the sales curve and estimate the level of sales after the effects of the product’s introduction subside. The present state of the art allows reasonably accurate forecasts to be made between three and six months after introduction.

A Typical Sales Curve for a New Convenience Product



The three most common projection methods are those having to do with income, sales, and market share as follows:

$$1. \text{ National sales estimate} = \frac{\text{Total national income}}{\text{Test area income}} \times \text{Test market sales}$$

$$2. \text{ National sales estimate} = \frac{\text{National sales of Related product}}{\text{Test area sales of same product}} \times \text{Test market sales}$$

$$3. \text{ National sales estimate} = \frac{\text{Share-of-market ratio In the test area}}{\text{National sales the product sales}} \times \text{Test market sales}$$

The share-of-market method provides the most accurate national projection of sales, but its usefulness is limited in that it requires accurate estimates of national sales of the product category involved, assumes that the test product will not expand the sales of the product class, and is more expensive to apply because it requires information that necessitates auditing the total product class.

Electronic Test Markets

Test market data are obtained using a variety of research instruments, including store audits, continuous consumer panels, and personal interviews via telephone. Increasingly, companies are using electronic mini-market tests that not only reduce the costs of a traditional test market project by as much as a third but provide the needed data more quickly. Such “high-tech” research methods generate single-source data; that is, they track the behavior of individual households with respect to both their media habits and their purchases.

The result is a measure of the impact of one or more marketing variables such as advertising copy, price, and a particular type of consumer promotion (e.g., coupons) on the trial and repeat purchases of a new product. Such single source research systems are also used to test the effect of advertising commercials, advertising weight, media scheduling, and promotions on the sales of established products.

Microcomputers in each panel household record TV viewing. These data are also sent to the central computer. Control towers beam commercials into individual homes, thereby enabling the research company to control the commercials viewed by given households (i.e., it can substitute one commercial for another). Thus, the electronic system enables a company to test two different marketing programs in one city. It does so by dividing the 3,000 sample households into two target groups (matched on the basis of prior purchases) and testing a different marketing program on each.

A major problem with this type of testing is that it provides little information on trade response, since the new product is guaranteed full distribution by the research company. Further, because store displays are set up and maintained the ideal way throughout the test, consumers are likely to sample the product at a faster rate than would normally happen. Because of these trade problems, some companies supplement electronic testing with a traditional-type test market.

Significance of Motivation Research

Motivation research is a “Systematic analysis of the motives behind consumer decisions, used especially by advertisers and marketers to assess attitudes toward products and services”. The research used to investigate the psychological reasons why individuals buy specific types of merchandise, or why they respond to specific advertising appeals, to determine the base of brand choices and product preferences has gained significance with increasing competition and growing awareness of consumers.

Known hidden motives - Motivational research methods are aiming to bring out and comprehend what the consumers do not fully understand about themselves. On the other way, implicitly, these researches presume the existence of an underlying or unconscious motive, which will influence the consumer behavior.

Typically, these unconscious motives (or beyond-awareness reasons) are intertwined with and complicated by conscious motives, cultural biases, economic variables, and fashion trends (broadly defined). Motivational research attempts to separate through all of these influences

and factors to unravel the mystery of consumer behavior as it relates to a specific product or service, so that the marketer better understands the target audience and how to influence that audience.

Drivers of consumption - Motivational research methods attempt to identify various forces / factors which influence / drive consumers, of which they may not be aware of them exactly (*e.g., cultural factors, sociological forces*).

Motivational research is most valuable when powerful underlying motives are suspected of exerting influence upon consumer behavior. Products and services that relate, or might relate, to attraction of the opposite sex, to status or self-esteem, to power, to death, to fears, or to social taboos are all likely candidates for motivational research.

For example, why do women tend to increase their expenditures on clothing and personal products – such as shampoos, hair dyes, and other facial related cosmetics, as they approach the age of 50 to 55?

The negative influences are : (i) The loss of beauty (ii) Fear of aging. The positive ones are: availability of discretionary income, catching up with the trends . It is a time of life when discretionary incomes rise as children leave the nest).

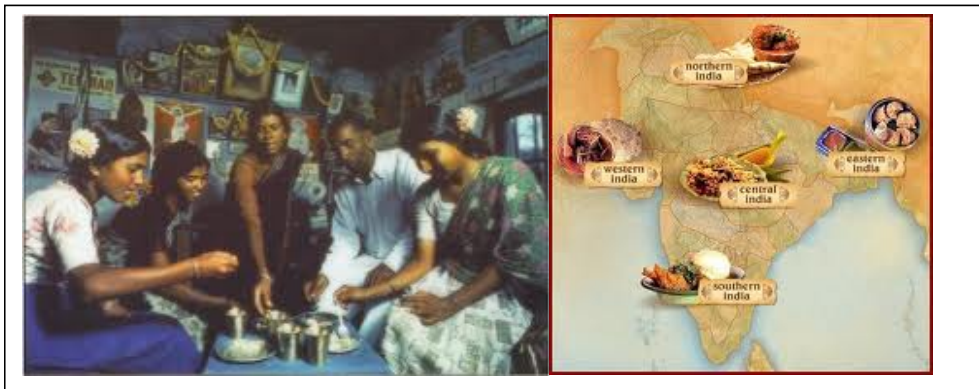
Many motives are at work, which a standard marketing research survey would never reveal them. Most women are not really aware of their motives.

It is not only the high involvement product categories, but even low-involvement product categories can often benefit from the insights provided by motivational research. Typically, in low-involvement product categories, perception variables and cultural influences are most important.

For example, Indian dining habits at the dining hall is different; the above picture will reflect the same. We have wide varieties of systems within the country. On the other hand, consider a foreigner who is dining with his family and relatives [given below in the picture].



For example, in India, the culture consists upon various systems of rules and “regulations” that simplify and optimize our existence. Cultural rules govern how we squeeze a tube of toothpaste, how we open packages, how we use a bath towel, which does what work, etc. Most of us are relatively unaware of these cultural rules. Understanding how these cultural rules influence a particular product can be extremely valuable information for the marketer.



Case of Kellogg's Indian Experience



Unfortunately, success in America, Britain, Japan, Korea, or even China doesn't mean that consumers in other countries, especially new consumers, will have heard of your product — or like it once they do.

This has been the case in India. The stories range from the relatively simple, such as the disappointing launch of Corn Flakes in India, to the complicated, such as McDonald's (MCD) big challenge in adapting a beef-centric product line to a country in which cows are sacred.

Kellogg's set up a branch in India and started producing Corn Flakes to give consumers the real thing. What they didn't realize was that Indians, rather like the Chinese, think that to start the day with something cold — like cold milk on your cereal — is a shock to the system, and if you pour warm milk on Kellogg's Corn Flakes, they instantly turn into wet paper. The people in the north would typically have paranthas while those in the South have Idly, Dosa etc. Rice Flakes (known as Aval in South, Poha etc elsewhere) is also in the Indian menu. So the company had to not only promote the brand but push the idea of having breakfast cereal.

Thus, the motivation research methods attempt to find out the deeper insights in the consumers psyche.

Tools of Research

The motivation research methods are predominantly undertaken through unstructured – exploratory methods – such as observation, focus groups, and depth interviews.

Observation - Observation can be a fruitful method of deriving hypotheses about human motives. Observation can be accomplished in-person or sometimes through the convenience of video. Usually, personal observation is simply too expensive.

It is easier to observe consumers in buying situations than in their homes, and here the observation can be in-person or by video cameras. Generally, video cameras are less intrusive than an in-person observer. Finding a representative set of cooperative stores, however, is not an easy task, and the installation and maintenance of video cameras is not without its difficulties. In-store observers can be used as well, so long as they have some “cover” that makes their presence less obvious. But, observation by video or human eye cannot answer every question. Generally, observation must be supplemented by focus groups or depth interviews to fully understand why consumers are doing what they do.

The Focus Group - The focus group discussion is conducted by a skilled moderator. If the focus group is non-directive in nature, it makes use of full motivational potential as the group may show spontaneous interactions among its members. It is the mutual reinforcement within the group (the group excitement and spontaneity) that produces the revelations and behaviors that reveal underlying motives.

The Depth Interview - A depth interview, is a lengthy (one to two hours), and one-on-one, personal interview, conducted directly by the motivational researcher with the respondents. Much of the power of the depth interview is dependent upon the insight, sensitivity, and skill of the motivational researcher. The interviewing task cannot be delegated to traditional marketing research interviewers—who have no training in motivational techniques.

- During the personal interview, the motivational researcher strives to create an empathic relationship with each respondent, a feeling of rapport, mutual trust, and understanding.
- The researcher creates a climate in which the respondent feels free to express his feelings and his thoughts, without fear of embarrassment or rejection.
- The researcher conveys a feeling that the respondent and his opinions are important and worthwhile, no matter what those opinions are.
- The motivational researcher is accepting, nonthreatening, and supportive.

The emotional empathy between motivational researcher and respondent is the single most important determinant of an effective interview.

Projective Techniques

They play an important role in motivational research. Sometimes a respondent can see in others what he cannot see—or will not admit—about himself. The motivational researcher often asks the respondent to tell a story, play a role, draw a picture, complete a sentence, or associate words with a stimulus. Photographs, product samples, packages, and

advertisements can also be used as stimuli to evoke additional feelings, imagery, and comment.

During the interview, the researcher watches for clues that might indicate that a “sensitive nerve” has been touched. Long pauses by the respondent, slips of the tongue, fidgeting, variations in voice pitch, strong emotions, facial expressions, eye movements, avoidance of a question, fixation on an issue, and body language are some of the clues the motivational researcher keys on. These “sensitive” topics and issues are then the focus of additional inquiry and exploration later in the interview.

Each interview is tape-recorded and transcribed. A typical motivational study, consisting of 30 to 50 depth interviews, yields 1,000 to 2,000 pages of typed verbatim dialogue. During the interview, the motivational researcher makes notes about the respondent’s behavior, mannerisms, physical appearance, personality characteristics, and nonverbal communication. The notes becomes a road map to help the researcher understand and interpret the verbatim transcript of the interview.

Content Analysis

The motivational researcher reads and rereads the hundreds of pages of verbatim respondent dialogue. As she reads, the researcher looks for systematic patterns of response. She identifies logical inconsistencies or apparent contradictions. She compares direct responses against projective responses.

She/he notes the consistent use of unusual words or phrases. She studies the explicit content of the interview and contemplates its meaning in relation to the implicit content. She searches for what is not said as diligently as she does for what is said. Like a detective, she sifts through the clues and the evidence to deduce the forces and motives influencing consumer behavior. No one clue or piece of evidence is treated as being very important. It is the convergence of evidence and facts that leads to significant conclusions. In the scientific tradition, empiricism and logic must come together and make sense.

Cultural Level Analysis

The analysis begins at the cultural level. Cultural values and influences are the ocean in which we all swim and, of which, most of us are completely unaware. What we eat, the way we eat, how we dress, what we think and feel, and the language we speak are dimensions of our culture. These taken-for-granted cultural dimensions are the basic building blocks that begin the motivational researcher's analysis.

Once the cultural context is reasonably well understood, the next analytic step is the exploration of the unique motivations that relate to the product category.

What psychological needs does the product fulfil?

Does the product have any social overtones or anthropological significance?

Does the product relate to one's status aspirations, to competitive drives, to feelings of self-esteem, to security needs?

Are masochistic motives involved? Does the product have deep symbolic significance?

And so on. Some of these motives must be inferred since respondents are often unaware of why they do what they do. But the analysis is not complete. Often, it is expected to have a quantitative study after a motivational study – to confirm the various points, hypotheses formed by the study.

Summary

In recent years, more use has been made of pretest market research in product research. The techniques, while possessing obvious limitations, are conceptually sound and offer considerable promise. New product introduction process is briefly discussed and followed by a discussion on the process of conducting product research. We have also discussed the meaning and importance of motivation research methods. To get a better

understanding, a brief case study is discussed and various methods of conducting motivation research are explained.

Discussion Questions

Research indicates that many products fail. Very few lucky ones succeed. Is there real need for informed decision as success probability is less? Discuss.

Mini-Projects

1. If you are the marketing researcher in- charge of a FMCG company; the company wants to conduct a study on acceptance of packaged – ready-to eat vegetables. How will you conduct a study on acceptance of this new product?
2. Mobile operators would like to understand the motive behind having two mobile phones / two mobile connections in Indian context. What kind of motivation research methods you will employ?

Lesson 5.2 - Advertising Research

Learning Objectives

- To discuss the decision areas in advertising
- To discuss creative strategy research and its role in the development of an advertising message
- To examine media aspects for advertising effectiveness
- To describe and evaluate alternative ways of pretesting advertising copy

Introduction

Advertising is certainly one of the more important and most complex decision areas facing business executives. Advertising research primarily relates to three critical decisions that have to be made to develop an advertising program: (1) setting objectives, (2) selecting the message, and (3) choosing appropriate media vehicles. Finally, managers would ideally want to see the “payout” in terms of sales or profits. In these areas, marketing research is necessary for providing information for decision making.

Scope of Advertising Research

Advertisers has to take the following key decisions

- Determine the objectives of advertising
- Decide the nature of appeal /message to develop
- Decide on how should they be presented? What copy should they use? What headlines? What pictures and /or symbols? What situations?
- Decide on the media in which the ad is to be placed and how frequently it should be presented? Should they use newspapers,

radio, magazines, television, billboards—or some combination thereof? If they choose radio or television—what program? What day of the week? What time of day?

- Decide on how the effectiveness of ad is to be evaluated for its effectiveness?

In order to answer these questions, it is necessary to know the target audience and have detailed information about their likes and dislikes and how do they respond to ads..

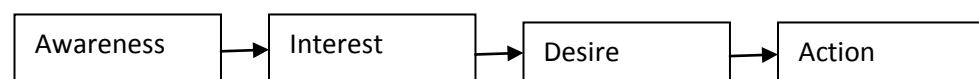
For example, Uni-Lever used a huggable teddy bear named Snuggle to build a \$300 million fabric softener brand. In an effort to find out why Snuggle was so successful, Lever had the teddy bear psychoanalyzed. The verdict was that “as a symbol of tamed aggression, the teddy bear is the perfect image for a fabric softener that tames the rough exterior of clothing.” What counts here is the effect of the total copy on the target market, and marketing research can help determine what that effect might be.

It is therefore, has become important to have various types of advertising research. In India and other countries, a number of specialized research agencies provide information on advertising.

Advertising Objectives and Product Appeals

Ideally, advertising objectives should be stated in terms of sales or profits. However, this is difficult or impossible given that advertising is only one of the input variables, and it interacts with other controlled and uncontrolled variables that also impact sales and profits.

The objective of advertising is to trigger behavior that will lead, in some way, to a sale. Rather, what is needed is a measurement of the process by which the desired response was achieved; that is, the communication must attract the attention of the target group, be understood, and convince all concerned that the product can meet their needs better than alternative products.



In recent years the use of attitude maintenance or shift as a measure of advertising effectiveness has grown in importance. To achieve any attitudinal change objective, the communication must satisfy several requirements, including attracting attention, being understood, and being convincing. The measures used are

The measure of advertising's success in terms of communication objectives are:

- Awareness levels and percentage of people aware
- Aided -Recall aided
- Unaided recall
- Like and dislikes
- Buying intentions

This approach assumes that attitudes are predictors of behavior and that they can be measured with some reasonable degree of accuracy. Thus, many advertising effectiveness measures implicitly recognize the importance of attitudes and work directly or indirectly to measure them. A measure concerning the degree to which a product's salient features "fit" those of the ideal brand, results in a set of data of considerable value to the advertising manager as well as the copywriter. In lieu of measurements of attitudes per se, purchase intention measures are often used as a way of testing advertisements that seek to increase the likelihood of purchase by changing beliefs and evaluations. This summary measure can be used to compare the effect of different ads.

Research on advertising objectives can also be classified as per their objective in terms of informing, persuading, or reminding.

Information	Awareness and recall of announcements of products, prices and promotion incentives
Persuasion	Brand preference, commitment, trust, and loyalty
Reminding	Recall measures

Copy Research

Copy research seeks to evaluate alternative ways for advertisers to present their messages. Copy refers to an entire advertisement, including the verbal message, pictures, colors, and dramatizations, whether;

the advertisement appears in print, on radio or television, or via some other medium. This is a critically important area. According to a study 1 60 commercials in a given test were miscomprehended and that the average amount of miscomprehension was 30 percent. Miscomprehension occurred across all age, income, and education groups.

There are many different copy-testing methods.

If the “objective is to persuade, then a measure of purchase intent will be used. If attitude shift is what is wanted, then scales will be used to measure change. If exposure to a message over time is considered essential, then in-market controlled experiments will be used.

Measures dealing with recognition, recall, comprehension, believability, persuasion, and attitude change are the more typical measures used to judge advertising effectiveness. All involve assumptions on how advertising works. One of the basic problems is that most research cannot measure the long-term effectiveness of advertising. And yet, we know that many attitudes change very slowly.

Copy testing is divided into two major parts:

- **Pretests** - Those tests made before the copy is released on a full-run basis
- **Post-tests** - Tests done after the copy is run (after or post-tests).

Pre-tests are designed to determine what weaknesses exist in the copy before too much money has been spent on the advertising. After or post-testing attempts to measure the combined effect of the advertising, the media used, the scheduling, the product's distribution, and competitive advertising. The distinction is not always clear since some “before” tests call for the advertising copy to be run in one or several media. Such tests are an attempt to simulate the real world and, thus, are properly classified as pre-tests.

Creative Strategy Research

A product's creative strategy is concerned mainly with determining what message can best elicit the desired response from members of the

target audience. When it is necessary to select one or a few ideas from a large number, concept sort tests can be used. The ideas can be written in the form of one or two statements and typed on a 3 x 5 card. Respondents proceed to sort these cards “. . . into piles based on some evaluation criterion, such as intention to purchase, or more descriptive scales—uniqueness, importance, or believability. Typically the concepts having the highest box score are developed further. Alternatively, the responses can be factor analyzed to see if several concepts should be combined into a more general concept.” It is difficult to evaluate concepts concerned with emotional appeals (e.g., the use of a brand by certain types of people) versus benefits derived from physical product features.

Focus group discussions can often provide important insights into the relative importance of various concepts. A skilled moderator may gain insights into why consumers prefer one brand to another as well as how consumers feel and think about advertising for a given product class or type.

Consumer Jury

A group of potential consumers of the product may be assembled and asked to vote on the alternatives. The copy may be made up in dummy form or the major theme placed on cards. Respondents are then asked to rank the alternatives according to their preferences or interest in buying the product. It is assumed that respondents will always like at least one advertisement; in reality, the rating may be on the basis of which advertisement is disliked the least.

A variation of the above is sometimes used to analyze television programs and commercials. The procedure consists of exposing the audience to the program or commercial and having members record at specific intervals whether they liked, disliked, or were indifferent to what they had just heard or seen. This can also be accomplished using an electronic machine known as the program analyzer. The machine has two buttons; and the respondents press one when they find the program interesting, the other when the program is uninteresting, and neither when they are indifferent. A record machine summarizes the data and charts the continuous reactions of the audience. Such machines do not measure the extent of feeling or identify reasons for liking or disliking.

Rating Scales

Consumers or advertising agency personnel are asked to “rate” alternative ads. First we have to establish standards for effective copy and numerical weights for it. The weights indicate a standard’s relative worth in the overall success of the copy. Ads are then rated in accordance with the scale values and a numerical score obtained. If the total weight for one item, for example, is 10, analysts might give one ad 5 if they think it is near average on that item. The total of the individual scores provides the numerical rating for an ad.

The major advantage of a rating scale is that it provides a list against which to check an ad and helps to single out the elements of an ad that are good and bad. The disadvantages are: (1) while the scale items may be well selected, it is difficult to set up relative weights regarding their contribution to the “ideal” ad; (2) different judges will rate the items differently, leaving the question of who is right; and (3) high scores may not be an indication of success, since the ad may have received high scores on most items but low scores on a few.

Leo Burnett agency developed VRP (Viewer Response Profile) that differs from other copy-testing methods by seeking to measure a viewer’s “experience” with a commercial on seven dimensions. The seven dimensions included in the scale are entertainment, confusion, relevancy, brand reinforcement, empathy, familiarity, and alienation.

Scale items are evaluative statements made by consumers about commercials in general. VRP focuses on the emotional component of communication effects and provides information relative to such questions as: “Do viewers empathize with the characters and situations in the commercial?” and “Do viewers see the commercial as confusing, entertaining, or unusual?”

Portfolio Tests

These tests are named after the manner in which the advertisements to be tested are “packaged.” A group of ads, usually a mixture of test ads and control ads, is placed in a portfolio. Sometimes the ads are actually placed in dummy copies of newspapers or magazines. Respondents who

are thought to be representative of the target audience are given the folio and asked to go through it, reading whatever interests them and taking as much time as they want. After completing this task, the respondents are asked to recall (with the folio closed) the ads that they can remember. Such recall may be on a completely unaided basis, or the interviewer may aid recall by asking about specific ads or ads for specific products. For each recalled ad, the respondent is asked to play back as much of the ad as possible. This information is recorded verbatim. Additional questions may be asked about such things as the believability of the claims in the ad, the general reaction to the ad, and whether the respondent uses the product.

Frequently, the portfolio test is used to test the merits of two or more alternative ads. In such cases, an experimental design is used in which two or more sets of folios are prepared. The only difference between folios is that one set contains test ad A, another set contains test ad B, and so on. The non-test ads (control ads) are the same in all folios—and are positioned in the same order. By using small matched samples and comparing recall and playback scores among the various groups, a “winner” is obtained.

Psychological Tests

Psychological tests employ a variety of research techniques, including word association, sentence completion, depth interviewing, and story-telling. Typically, a number of these techniques are employed on the same study. The major objective is to find out what respondents see in various advertisements and what it means to them. Such studies can be undertaken either before or after the copy has run. These are difficult studies to implement since only skilled interviewers can be used. The content needs to be developed by a trained individual and the results are difficult to interpret. The need for skilled interviewers (expensive) leads to relatively small samples, sometimes as few as 10 to 15 respondents, so the results are subject to wide variation.

Physiological Tests

Measures derived from physiological tests are obtained using special laboratory equipment which records an individual's physiological responses to advertisements.

- **Galvanic skin response** - It uses a device similar to the polygraph machine, which is used in lie-detection work. Respondents are linked by electrodes to a monitor and are exposed to a number of stimuli in the form of test and, control ads. It measures the amount of perspiration occurring on the hands. Advertising effectiveness is judged on the basis of the “arousal” registered on the monitor.
- **Eye movement test** - It records continuously the activity of the eye—both horizontal and vertical—as it reads printed material. By analyzing the route “taken,” researchers can determine what part of the advertisement attracted the initial attention, what was interesting in it, and whether there was any part which appeared confusing.
- **People reader** - It permits both finished ads and those in rough draft form to be tested in a real-world setting. The machine resembles a lamp, and when respondents sit in front of it, they are not aware that it is recording both their eyes and the reading material at the same time.
- **Pupil-lo-meter** - Ppupil dilates when respondents receive an interesting stimulus and contracts when individuals receive uninteresting stimulus. By comparing the changes induced by a message effectiveness can be obtained.
- **Tachisto-scope** - Another device, the tachisto-scope, permits researchers to control the amount of time (in fractions of a second] that an advertisement (either in rough or finished form] is exposed to a group—or to an individual. This permits researchers to study perception and comprehension under rigid time conditions. Thus, for example, the ability of outdoor billboard copy to impart a message can be tested under simulated exposure conditions.

After Tests

Once an advertisement or campaign has “run,” advertising effectiveness can be measured in terms of inquiries, sales and brand equity

Inquiries: Some advertisements invite sales inquiries. In such cases, inquiry tests may be conducted. The offers are so “keyed” that they can be traced to the specific advertising copy and medium. The number

of inquiries received should indicate the “pulling power” of the different pieces of copy.

1. An offer may be placed in different pieces of copy placed in different issues of the same medium.
2. The same offer is placed in different advertising copy that appears in different magazines or newspapers.
3. The same offer is placed in a medium that provides a split-run service. This is a procedure whereby half the copies of the magazine or newspaper contain one piece of copy and half contain another piece of copy. This is accomplished in a systematic way so that the two pieces of copy reach similar audiences.

Sales Test

Sales tests may be simulated in a variety of ways—for example, consumers are exposed to alternative pieces of copy through point-of-purchase displays or direct mail. In the case of point-of-purchase displays, the need to test two advertisements would require two matched store samples. Product sales would be measured in each store before and after the introduction of the appropriate display. The changes in sales between the two periods for the two store samples would be compared, and that group with the largest increase would be presumed to have the best copy. Similar experimental design studies can be conducted by mail, using coupons.

All, with the exception of inquiry and sales tests, are based on the respondent’s memory. This raises the question of how soon after the advertisement has run the measurement should be made. Since learning should increase with more exposure, a copy test based on a single viewing of a TV commercial will not provide an accurate measure of the ad’s performance.

Brand Equity Tests

Recall tests of advertisements typically cue the respondent as to the specific media vehicle/involved (e.g., the June issue of Fortune), as well as the product class (e.g., minicomputers) and perhaps even the sponsor (e.g., Commodore). Given such cues, the respondent is asked to play back

as much of the ad as possible. The same approach, but with modifications, can be used with TV and radio commercials.

Recognition tests are used primarily with print ads. “The critical thing that defines a recognition test is that the person is given a copy of the information he or she needs to find in memory.” In the typical advertising recognition test, a respondent is shown a series of ads contained in a specific publication issue to which the respondent has been exposed. The subject is then queried as to whether or not she or he has even seen the particular ad in that issue. Thus, Starch—a widely recognized advertising rating service— uses a procedure that consists of asking qualified readers of a given magazine to point out which advertisements they noted and read. If an advertisement is reported as “noted,” the respondent is asked to indicate what parts were read.

Media Research

The goal of the advertiser is to select a media schedule to reach the specified market segments. They must decide (1) frequency of message exposure (2) reach of consumers in the market segment. Frequency and reach are inversely proportional. As frequency increases, penetration in limited market increases. However, coverage will be less.

Media types - Media decision is complicated as one there is a wide choice. The major media types are: newspapers, bill-boards, magazines, radio, and television. Again within them, there are varieties to choose-like should be its Femina or Womens’ Era? Should be it be in the next issue or later issues? What should be the size of ad? In case of radio and television there is not only the question of what networks or stations, but what programs, what day or days of the week, and what time of the day.

Factors influencing media choices - What factors of a media vehicle will influence advertising effectiveness? Factors such as editorial climate, target population’s enthusiasm, and the amount and type of advertising carried will likely impact a media vehicle’s effectiveness with respect to advertising. The problem is that it is almost impossible to identify and weight such factors for alternative vehicles at the time the advertising is scheduled.

Size of audience With few exceptions, media research is concerned with measuring the size and composition of individual vehicle audiences. The number of readers, viewers, or listeners is basic in selecting a medium; In addition, some awareness of prospects and non-prospects in the audiences is important to evaluate alternative media.

In the case of print media, the audience is typically defined as being comprised of individuals who say they have seen one or more major editorial features. With television and radio, the audience can be defined in various ways, such as sets tuned to a program or number of people listening or watching.

Frequency and reach of ad - Over the years a great many studies have sought to determine the appropriate level of repetition. Low levels of repetition within a purchase cycle will obtain the required amount of attitude and behavior change necessary for purchase. Low repetition consists of three or four exposures during the product's purchase cycle. It is about four weeks for most house-hold packaged products.

Since advertising is forgotten (wears out) over time, there is also the question of whether a pulsed or burst schedule should be used in contrast to one using constant spending. Generally speaking, the situation variables which argue for the use of low repetition schedules favor constant spending.

Circulation research - For newspapers, circulation is broken down by daily and Sunday editions. For magazines, circulation data are shown by census regions and city-size groups.

Readership surveys - Respondents are classified on the basis of whether they "claim" to have read any of the editorial contents of the particular issue. The usual procedure is simply to interview continuously over a given time period and, therefore, to provide an "average" readership count. Some times, due to cost factor, only a very few issues are studied in a given year by the respondents. Readership of individual issues as such varies widely. Some people say they are readers, though they are not. Certain publications (like Femina, Vogue, and Readers Digest) have a status connotation that affects reported readership substantially.

Viewership Surveys

The pro-gram and the advertising message are often mixed, and it is difficult to divorce the two. There are four basic ways to measure the size of the audience for any radio and television program. Each of these is discussed briefly below.

- **Coincidental Method** This method is based on a sample of homes, using the telephone to solicit responses about what radio and television programs are being listened to or viewed. Typically, respondents are called and asked whether anyone in the home is listening to the radio or viewing television, and, if so, to what program and station they are tuned. This system has the advantage of speed and economy; nevertheless, it has severe limitations.

(i) First, the results may not be valid, since only homes with telephones are included. (ii) The method does not produce any continuous information about the audience. (iii) A third major limitation is that calls must be limited to certain hours of the day and night, such as after 8:00 a.m. and before 10:30 p.m. (iv) There may also be a tendency on the part of some respondents to report they are viewing a more socially approved program than they are.

- **Roster Recall.** This is a technique that consists of aided recall via per-sonal interviews. The interviewing is done shortly after the particular time period (usually four hours) to be measured has been completed. A list, or roster, of programs by quarter hours is used to aid respondents in remem-bering what programs were listened to or viewed.
- **TV Meters.** The use of electronic recorders (sometimes referred to as passive meters) that can be attached to a television set without interfering with its normal operation to monitor TV audiences. The machine uses to record when the television set is on and to what station it is tuned. All of this is keyed to time periods so that a continuous record is provided. Thus, the following data are reported:

1. *Total audience*—number and percent of television homes tuned to each program for a minimum of six minutes.

2. *Average audience*—equivalent to the number of television homes tuned to the full program (the average number of homes minute by minute).
3. *Share of audience* = Number watching a program /total number of viewers,

Diary Method

This method obtains estimates of listening or viewing by having respondents record in a specially designed diary their radio listening or television viewing, or both. Such an operation assumes that the panel members will cooperate by recording their listening or viewing at the time it occurs and, thus, will do it accurately. If this assumption is valid, then the diary method has an advantage—that of obtaining data on individuals viewing programs. Even so, the diary cannot provide a precise minute-by-minute audience flow as does the audimeter. A continuous panel operation can provide much useful duplication data, not only between radio and television programs, but also between programs and other media to which the individual was exposed, such as magazines and newspapers. A major problem with using diaries is that many panel members do their recording of programs watched only once a week, and, thus, popular programs (such as the “Cosby Show”) are over-reported. This over-reporting can be explained largely on the basis of the halo effect present with highly popular shows, which respondents report viewing more often than is true.

People Meters

The most recent technological breakthrough is called a People Meter (an import from Europe), a remote-controlled box with buttons that send signals to a small control box on top of a TV set. Each household member pushes his/her assigned button every time (s)he starts or finishes watching TV. The information about who is watching is recorded electronically and relayed to a computer that has on file the age and sex of each household member. Audience data at the individual level can be provided to clients within 24 hours.

It has a limitation. Just because people push buttons does not mean they are looking at television. Also, people are not always totally reliable (especially children and teenagers) in pushing buttons, and there is likely a wear-out factor with some individuals; that is, after a year or so some people may consider it too much of a chore to cooperate fully.

Other Devices

The growth in the use of VCRs and remote control devices also causes TV audience measurement problems. So far the effects of such high-tech products are not incorporated into audience ratings. There are two major ways in which these effects (called zapping) impact ratings.

- The first is when a VCR is used to record a program and the “fast forwarding” function is used to avoid the commercials during the playback. It is estimated that such viewers “zip” past more than 50 percent of the commercials.
- The second type of zapping has to do with the use of a remote control device to mute commercials or switch away from them completely. The passive meter can distinguish between people and pets (based on body mass and seating pattern).; It requests the active meter to ask for the ID of anyone entering the room and records the exit time of anyone who exits and does not sign out. The company also has a TV tuning meter that is accurate up to 1/10 th of a second and can track some 138 channels. But the above system can only count those present—not identify them. And no system can tell if and when individual audience members are watching TV; for example, all the family is watching TV except for the husband, who is reading the newspaper.

Media Models

Almost all media models basically seek to maximize some measure of advertising exposure which is assumed to impact on sales. In brief, such models report, for a given advertising schedule, the number of individuals or households exposed and the number of times they are exposed. Since different schedules have different costs, the exposure “output” can be divided by the costs involved to obtain an effectiveness ratio.

In recent years there has been considerable interest in trying to obtain measures of the complete frequency distribution of exposure, the percent of the audience exposed once, twice, and so on. Such distributions are useful in measuring the value of one media schedule versus that of another.

Many advertisers obtain media exposure data that can be tied directly to brand usage. Such data clearly facilitate the selection of a media schedule, since a target audience can be selected and its exposure to various media vehicles can be determined as well. As Assail and Gannon note, it is far better to match media vehicles directly with target market members (prospective or actual product or brand users) than to match indirectly on the basis of mediating variables, such as demographic characteristics of vehicle and target audiences.

In spite of the apparent advantages of media models, they are handicapped by a lack of precise input data, especially with regard to current data pertaining to exposure effects, communications effects, forgetting, and response functions. In recent years, more emphasis has been placed on the adaptive interactive type of media model. Basically, such models are designed to look at media problems from a management point of view. They are “only as complex as the data and experience of the media planner.”

Summary

This lesson has given a brief discussion on media research – particularly, the marketers are keen to cut their ad budget and significant shift is already taken towards to promotional budget. A short discussion is made on copy testing so that the researcher can conceptualize the process of doing a media research.

Discussion Question

Mr. Maddy is responsible for setting the promotional budget for a microwave dish that cooks bacon on a rack over a drip pan. It is a new product for the market and for the small plastics manufacturer that Mr.

Maddy works for. Maddy has only a very limited amount of time to set the budget. Discuss factors Maddy should consider when setting the advertising research.

Mini-Project

Collect ad copies of a product like shampoo. Assemble a focus group of 5 persons. Show the ads. Ask them to evaluate them in terms of message (Is it clear ?), product presentation(Is it memorable?), tag line (is it catchy?), and design (Is it attractive?).

Lesson 5.3 - Sales Control Research

Learning Objectives

- To explain sales control and information needs
- To introduce the methods of sales control research

Introduction

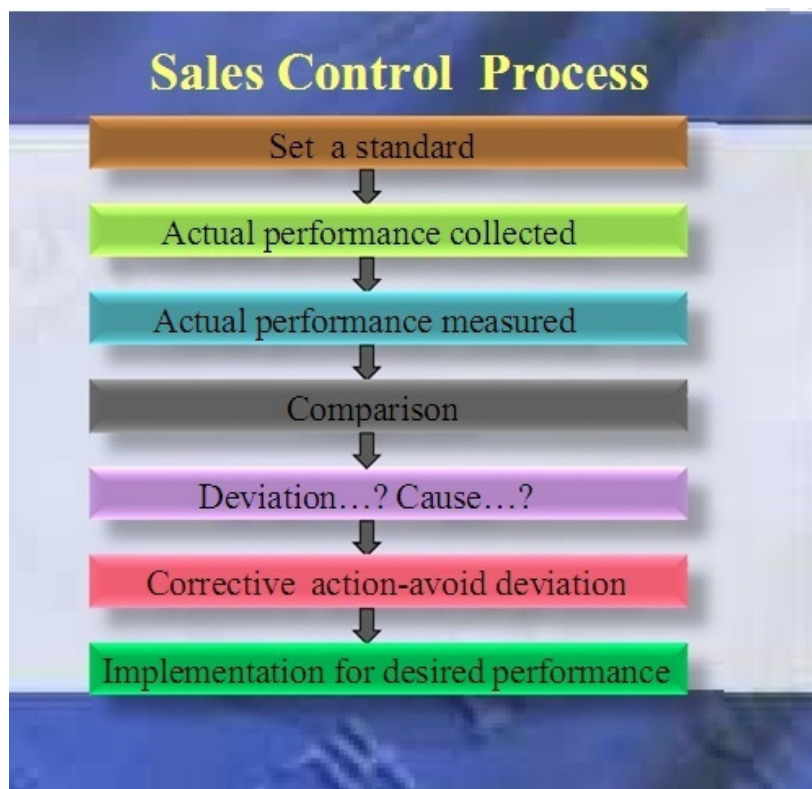
Marketing research initiatives concerning management control have taken different approaches. Sales control is important to achieve results with economy of resources utilized, efficiency of people and equipment used, and effectiveness in achieving objectives. As such measures are necessary for examining periodically how controls are designed and executed.

Sales Control Process

Sales control has two facets : (i) people or sales force behaviour and (ii) costs and benefits. Anderson and Oliver define a sales force control system as

“An organization’s set of procedures for monitoring, directing, evaluating, and compensating its employees”

Sales control requires the establishment of standards, the evaluation of actual performance and the correction of deviation in performance. From the definition, it is very clear that sales control not only deals with managerial action to actual sales, but it also covers many other activities of marketing – which include right from physical distribution of products or services form producers to consumers. Figure shows the steps in sales force performance evaluation.



Sales force control process

Sales Control Research Methods

The basic tool for controlling sales efforts is sales programme with schedules, targets and sales expense budget.

Marketers need the following activities to help them plan and control sales activities.

- **Business analysis** - It includes Business Risk Tracking System in all areas of operation. Periodic Reviews under the Business and Environment Risk Analysis reporting by the respective business.
- **Market Trend Analysis** - Constant innovations and newer offerings to bridge technology gap, Changing consumer preferences with proactive steps
- **HR policies** - Competitive policies that attracts and retain best of industry talent.
- **Training trends** - Training approaches that involves knowledge portals to enhance the skill set of the employees.

- **Control trends** - Processes for formulating and reviewing annual and long term business plans through Internal audit and Audit Processes

New tools and techniques are in the offing with the advent of internet and computer analytical powers. Different sales control methods, both short term and long term are found in practice. Table shows them.

Sales control methods

Method	Information
Annual plan	Targets for achievement in the operational year, and support plans like schedules, budgets and programmes
Sales analysis	Variations from target- brand wise territory wise, sales team wise, etc, time when deviations occurred and reasons for variations.
Market share analysis	Relative, served and total market share information
Marketing expense – to-sales analysis	Productivity measures
Financial analysis	Return on investment, cost benefit analysis
Profitability control	Profits and sales ratios
Efficiency control	Sales calls, sales call time, sales costs, sales
Strategic control	Changes in distribution, promotion and sales
Marketing audit	Checking of entire marketing process and programs.

Annual Plan Control

Annual plan control ensures that, the company achieves the sales profit and other goals established in its annual plan. There are four steps in this process.

- What is happening?
- Why is it happening?
- What should we do about it?
- What do we want to achieve

The researcher has to go through various records pertaining to sales and do a research; these research findings shall be useful for establishing future control measures in the organisation.

Sales Analysis - Sales analysis measures and evaluates actual sales in relationship to goals. territory wise sales analysis and brand wise target achievement are analyzed to get the pulse of the situation. Inquiry is carried out on variations from the targeted sales- how much variations occurred, when it has occurred, and why it has occurred.

Market-share analysis - Company sales do not reveal how well the company is performing relative to competitors. For purpose, management needs to track its market share in one of three ways.

- Overall market share
- Served market share
- Relative market share

Overall market share = customer penetration *customer loyalty*customer selectivity*prices electivity.

In the recent years, many companies started working on 'Served Market Share' data; every month or week, the dealer / distributors / sales team has to provide the Served market share – over the last week / month and compare the target achievement.

Marketing Expense –to-Sales Analysis

It is important to make cost benefit analysis. To have a check on whether expenditures incurred for advertising , sales promotion and others are giving positive results, this ratio is computed. It gives total productivity of marketing.

In general, this ratio is 30% and consists of five component expense-to-sale ratios:

- Sales force-to-sales (15%)
- Advertising-to-sale (5%)
- Sales promotion-to-sale (6%)

- Marketing research-to-sale (1%) and
- Sales advertisement-to-sale (3%)

Again, the issue is how to fix the ratio; if the company is a new firm, obviously, the need to spend too much on marketing front to capture good market share. If it is an established firm, the immediate question is – do we need to allocate the same budget as that of the last month?

Financial Analysis It is a routine practice by many organizations to use financial analysis to identify factors that affect the company's rate of return on net worth. One of the obvious factors which affect the returns of any organization is its sales performance.

Financial analysis can be done with the help of costs, incomes and volumes. Return on investment tool can be used for determining as well as evaluating long term investments in promotion, distribution (setting up a new branch or adding a unit to a retail chain) or new product introduction.

Profitability Control- Companies can benefit from deeper financial analysis and should measure the profitability of their products, territories, customer groups, segments, trade channels, and order size. This information can help management determine whether to expend, reduce or eliminate any products or marketing activities

Many firms use to follow the following steps in controlling the profitability of the firm;

- Identifying functional expenses
- Assigning functional expenses to marketing entities
- Preparing a profit and loss statement for each marketing entities

For many years in the past to till data, Hindustan Lever Limited [now HUL] follows the sales distribution for division wise product range; the company has Main Line Division [deals with soaps, washing powder], Personal product Division [Tooth Paste, shampoo], and Beverages division [Tea, Coffee] and many other divisional form to sell the product.

Each product category is distributed by separate dealers and controlled by different team of sales managers.

Efficiency control

Efficiency control involves micro-level analysis of the various elements of the marketing mix. For example, to understand its sales-force efficiency, a company may keep track of how many sales calls a representative makes each day, how long each call lasts, and how much each call costs and generates in revenue.

Hindustan lever – the giant Fast Moving Consumer Goods [FMCG] company in the recent times, introduced sales man pass book scheme – where, each sales man is given a pocket size booklet, which will contain how many calls he made on a particular day, shop name, closing stock level at each shop, orders made on a day, rupee value of the order, line-wise, pack wise details of orders, and many other details.

For assessing channel efficiency, management needs to search for distribution economies in inventory control, warehouse location and mode. It should track such as: Logistic cost as a percentage of sales Percentage of order filled correctly Percentage of on-time delivery Number of billing errors.

Strategic Control

Each company should periodically reassess its strategic approach to the market place with a good marketing audit. Companies can also perform marketing excellence reviews and ethical/social responsibility reviews.

HUL has time tested distribution system, but it reworked a new distribution strategy. This new system not only reduced their distributor's closing inventory levels; but improved their profitability and the company is in better process of planning and producing the goods.

Marketing Audit - Marketing Audit is a comprehensive, systematic, independent and periodic examination of a company's marketing environment, objectives, strategies and activities, with a view to determine

problem areas and opportunities and recommending a plan of action to improve the company's marketing performance.

Summary

This lesson introduced the meaning of sales control, sales force control and various methods of doing sales control.

Discussion Question

Of all the strategies of marketing, product strategy is crucial. It requires sophisticated methods and reliable analytical tools. –Discuss.

Mini-Project

Collect three research papers on product or branding and develop a note on product research.

Lesson 5.4 - Rural Marketing Research

Learning Objectives

- To examine the differences between rural and urban markets.
- To identify issues that require special attention of marketing researchers

Introduction

The growth in the Indian economy has also led to the tides of prosperity making their way felt even in remote villages in the country. The purchasing power of rural communities has multiplied manifold and its time that this huge potential is tapped. Rural areas today have evolved into a huge and growing market which is consuming a large quantity of FMCG and consumer products.



Research Opportunities

Rural market has become a target for many FMCG companies during the last two decades.

Population - As per the Census of India, 2011, Rural India accounts for almost 70 per cent of the 1.21 billion populations, which is approximately 833 million live in rural India.

Education - Moreover, the growth of rural India is largely attributed by increasing awareness about need of education. According to the ASER (2012) report, private school enrolment in rural India has enhanced by 5.5 per cent points over past six years. The literacy rate has also gone up by 68.91 per cent in rural India.

Incomes and consumption - As per NCAER report and another report by Accenture Inc., Indian Rural incomes have been growing at more than 7 percent over the past several years, and this has resulted for almost 40 percent of India's total consumption of goods and services. In particular, the non-food expenditures are growing at an 8.2 percent annual compound rate. Rural households are purchasing a wide range of products—cars, flat-screen televisions, microwaves—that until recently would have been beyond their reach. Some industrial sectors have seen surprising growth coming from rural consumers. Fifty percent of revenues from the fast moving consumer goods (FMCG) sector now come from rural sales.

A report by the Technopak on Indian rural consumer highlighted that the economy is highly supported by increasing disposable income, Government initiatives and schemes and favourable demographics. As a result, the rural segment of the Indian economy is growing at a pace of 8-10 per cent per annum and is anticipated to add new consumption of US\$ 90 billion-100 billion over 2012-2017 to the current base of US\$ 240 billion-250 billion.

Technology - In the recent times, the rural people have been exposed to new communication technologies – such as satellite television channels to mobile communications and a range of services which has motivated the rural consumers to strive to be an urban consumer.

With the positive changes rural markets have become attractive for marketers and as such targets for research for research agencies.

Peculiarities in Rural Marketing Research

The marketing strategy for rural markets is different from urban markets. Issues such as inadequate infrastructure, low literacy, and high levels of poverty raise serious question marks about the conducting any studies in the rural markets.

Brand equity - In rural India, the branding rules are entirely different from urban markets. Rural people are interested in value for money and look for performance of a product in terms of long life and effective delivery of expected results. The association between reliability of a brand in delivering expected results, is not yet realised by many in rural areas. For building brand equity there is need for brand advertising and promotion.

Localisation - Rural branding calls for a greater component of local media and less of the mass media due to regional languages spoken in these parts. Since these markets have specialized forums of their own like temple festivals, melas, cinema halls, weekly Sandees, these can be leveraged to promote brands. Direct Marketing and events like road shows, film shows, melas, and street theatre can also be used to promote brands.

Cultural differences - The contours of the rural marketing environment are totally different from urban markets. Rural consumer behavior is deeply tied to their culture and belief system and a clear insight into it is needed if marketers want to be successful. Rural people are more affiliation oriented, uphold family values, and respect elders and educated. As such ads that stress family values and products made for family will be successful. They also have aspirations similar to urban. That is why mobile phone, dish TV, refrigerators and washing machines are found in rural homes.

Low literacy levels - The lower levels of literacy and limited exposure to product and services are well-known,

Income irregularities - There are also differences in occupation options, with a direct impact on income levels and income flows. Daily wage earners prefer sachets, and economy products. Farmers prefer to buy after harvest period. Spending on durable is linked to festivals and farm incomes. As such the rural demand is seasonal.

Wide geographical dispersion The villages are thinly populated and widely dispersed making marketing difficult. Table shows distribution of villages in India. Rural India accommodates more than 70 per cent of the Indian population who live in over 600,000 villages of varying sizes all over the country. The distribution of rural population creates a major

constraint for corporates to reach and promote goods or services and / or conduct studies of consumers in these areas

Distribution of Villages in India (2001)

Population	Number	%
Less than 200	114,267	17.9
200-499	155,123	24.3
500-999	159,400	25.0
1000-1999	125,758	19.7
2000-4999	69,135	10.8
5000-9999	11,618	1.8
10,000 and Above	3064	0.5
Total	638,365	100.00

Many languages and dialects - Besides 22 scheduled languages recognized by the Union Government of India and more than 100 nonscheduled languages, 216 mother tongues, each language with multiple dialects pose a major communication problem. The problem can be solved by using appropriate visual tools. Research agencies have developed visual tools to capture rating and ranking responses from the people of different languages and less literate people.

One such simple tool (Figure) help measure rating on a five point scale using human expressions. The highest scale was reflected with a very happy face and the lowest scale with a very sad face. These were developed into flashcards for the field researchers to use.

Working population migration - The working population will not be at normal places of residence due to migration, working in fields, extended visits to relatives, courts, government offices, and markets.

Poor access to women respondents - Accessing women for information is very difficult. Particularly, getting data from unmarried girls and young women by a male interviewer is highly impossible task. Each village shall have their own customs and practices that limit interaction with strangers especially males.

Caste based layouts of villages Caste is another greater issue in rural markets; many rural villages are divided on the basis of caste system and streets are clustered based on the caste group. So, doing a simple

random sampling is very difficult and also, some peculiar cases, the street – which you entered first to collect data may create huge bottlenecks to proceed further.

Summary

This lesson introduced the significance of rural marketing research and opportunities present in the rural markets of India besides gave an introduction about the rural marketing in India. Few points are discussed about in what way, the Rural Marketing Research is different and various points to be considered while undertaking the Rural Marketing Researches

Discussion

Rural marketing research requires tools that can elicit responses from less educated –Discuss.

Mini-Project

Visit a local village and observe how rural people make purchases by sitting near a retail shop. Prepare a report on rural buying methods.

Lesson 5.5 - Export Market Research

Learning objectives

- Discuss how export market research can be undertaken
- Explain the problems involved in export market research
- Identify analytical tools useful for research.

Introductions

As an expansion strategy, any firm would like to target the foreign markets. However, severing a foreign market is not an easy task. Selecting a new country to export any companies' products or to set up facilities to serve the markets require huge time from the top management team, heavy investments and tenacity. Marketers planning for an export marketing, can do initial research on potential markets (desk or secondary research) in any country using the reports available in the libraries, online directories, association reports, industry and government web resources and then go for field research to obtain specific information for his product launch.

Of course, this will cost more and increase the budget of the research projects and may involve more than one trip to the country to talk to people and develop relationship.

Desk Research

At the exploration stage, marketing researchers help executives by supplying information on promising markets or emerging markets. Any market researcher, undertakes export research projects, normally use the existing reports and information to complete the first stage of their market research about the country which they are studying. The sources of information are:

Historical data - Past records; these statistics can help the researchers to identify market trends such as quantities of shipments

from that particular country, commodity exported / imported. Also, the researcher has to check short term and long term trends. He has to do a time series analysis and find any spikes – ups and downs – fluctuations in demand due to seasonal factors or has there been a consistent rise in demand and so on.

Web sources - The evolution of worldwide web [internet], online library and governmental websites and publications can help the export marketing researcher to build up a better perspective of the potential markets they plan to explore.

Workshops and conferences - Other sources of information include networking events and workshops run by the trade associations, exporters associations and the local Chamber of Commerce or industry association. This kind of networking events can be particularly helpful as some of the best advice comes from experienced exporters.

Government organisations -A great deal of statistical and other information is available about each country in the worldwide web and other authentic directories. Many government trade ministries publish surveys of other countries for the benefit of their own exporters, which can be used by anyone.

Field Research

This second stage of research involves time and costs . However, it is an important for selecting the right market for your product or service. Smaller exporter may wish to reduce the costs of any market survey by using government services available.

- Trade Commissioners stationed at embassies abroad are only too willing to help the exporter assess the foreign market and suggest likely distributors.
- Export firm provides adequate product literature, samples and other necessary information.

If the market research required, is beyond the scope of the Trade Commissioner, he will suggest the names of some suitable local market research firms. Some manufacturer may decide not to export them, but

employ a trading house or export agent to act on its behalf in seeking market opportunities, promoting and securing orders.

Research agencies -For example , to promote the exports between countries, many countries extended bilateral cooperation activities and through which, funding various researchers and research organisations to carry out researches in the countries, for example, UK Trade & Investment's Export Marketing Research Scheme (EMRS) helps businesses carry out export marketing research on all the major aspects of any export venture. UKTI's Export Marketing Research Scheme (EMRS) helps the researcher to carry out export marketing research on topics such as:

- Regulations and legislation;
- Market size and segmentation;
- Customer needs, usage and attitudes;
- Distribution channels;
- Competitor activity, strategy and performance.

Of course, the agency specifies stipulations such as the applicant companies with fewer than 250 employees may be eligible for a grant of up to 50 percent of the agreed cost of market research projects.

Field research (or primary research) is where the researcher aims to get a feel for the market or markets him / she has targeted as a result of the desk research. This may be through surveys, interviews and usually involves one or more visits to the country to talk with potential customers and contacts. It is important to prepare for your visit to a potential market by clarifying your objectives so you can briefly explain:

- what your company does
- what your export objectives are
- what benefits your product or service offers
- what questions from your initial research you need answered

The manufacturer should determine which foreign market to target first. Exporters should always consider exporting Next Door. For example, a Malaysian firm, for example, looks north of the border such as Thailand.

For a decision on targeting a foreign market, the exporter may use a “Checklist” of factors.

- The potential size of the market for its product
- The types of customers, competitor’s products and their prices
- The most suitable channels of distribution
- The best way of entering the market (agent, joint venture, etc)
- The existence of any market opportunities that would provide a market “niche” and “competitive edge”

Checklist for Market Analysis

A ‘*marketing research checklist*’ should help a manufacturer organize its data and thoughts. The following points require to be examined for making decision on exports.

Demand analysis - Product advantages, Product acceptability, Potential demand in volume of units and Brand name.

Production analysis - Adequate plant capacity, and sufficient availability of raw goods.

Marketing analysis - Market Identification/ Size/ Geographic, **Competition**/Market Share, Product Suitability, Ware housing facility, Transport Facilities, Distribution methods and channel availability Trade Fairs and Trade Shows , Packaging or Products Strategies, Labelling products information, and After-sales services.

Social Environment analysis - Language Barriers, Demographics, Government Interference with Business and Society,

Legal environment analysis - Rules/Regulations/Labels,

Economic barriers- Tariff Barriers (Barriers to exporting), Non-Tariff Barriers (Hidden barriers to exporting), Economic Climate, Banking Facilities, Political Climate, Export Financing, Business Practices. Licensing & Joint Ventures

Technical environment analysis – Patents and copy rights. Innovations and new product introductions.

Summary

The lesson has started with a brief introduction about export marketing research and its importance. Also, various methods of conducting research – such as desk research and field work are discussed and a check list is provided for the marketing research to carry out research in export domain.

Discussion Question

Researching a foreign market can be done by desk research. Today web resources provide plenty of information about different nations. Field research is a waste of time. Discuss.

Mini-Project

TATA Motors wants to export the NANO version of cars to Sri Lanka and Bangladesh. What steps do you take in export marketing research process?

Self Assessment Questions

1. Explain the role of marketing research in new product development.
2. How is test marketing conducted? What kind of measures can marketer use to take future decisions?
3. How do you screen product ideas? What is the role of marketing research?
4. What is motivation research? Why is it important for marketing decisions?
5. Explain the tools of motivation research.
6. Explain the need for motivation research with the help of a case study
7. Discuss the three types of advertising objectives and type of research necessary.
8. Explain copy research methods
9. Elaborate media research methods

10. Explain the use of machines in researching consumer views on ads.
11. What are pretest methods of copy research?
12. What are post test methods of copy research?
13. What statistical tools can be used in ad research?
14. What are the major problems and challenges in ad research?
15. Discuss the significance of sales control for a FMCG product
16. Explain the process of sales control and information needs the manager has.
17. Explain sales control measures for short term evaluation?
18. Describe long run sales control measures a firm can employ.
19. Discuss how rural market has undergone a change to become attractive.
20. Compare and contrast the consumer research in urban and rural markets.
21. What kind of innovations are needed while developing measurement instruments in rural marketing research?
22. Explain the need for export market research
23. Describe how desk research can be carried out.
24. Examine the need for field research and discuss the potential problems in it.
25. Prepare a check list of issues to be examined for making export decision.

CASE STUDY

A case study on white goods and readymade garments Retail industry's doldrums

The Retailers of white goods and readymade garments in Kanchipuram district faces a new crisis in the recent times. In the recent years, they observed that the number of customers visiting their shops slowly came down and the sales were affected very much. In the recent meeting of the traders' association, the topic was discussed. Many retailers

agreed that average number of customers visiting the shops gradually on the declining side, in spite of the growth in the various economic indicators.

Kanchipuram district is situated on the northern East Coast of Tamil Nadu and is adjacent by Bay of Bengal and Chennai city and is bounded in the west by Vellore and Thiruvannamalai district, in the north by Thiruvallur district and Chennai district, in the south by Villuppuram district in the east by Bay of Bengal. For administrative reasons, the district has been divided into 3 revenue divisions comprising of 8 taluks with 1214 revenue villages.

In the recent years, the district witnessed exponential growth in various industries. The district is known for its traditional Kanchipuram silk sarees and production of raw silk and agriculture. The district is one of the highly industrialised areas in the state of Tamilnadu. Besides MNCs like Ford, Hyundai, Saint Gobain, National Air Conditioner of Japan, Indian software giants Infosys, Wipro, and TCS are having their outfits in Kanchipuram district. Out of 17 Small Industries Promotion Corporation of Tamil Nadu's Industrial parks, 4 of them located in Kanchipuram district, in addition to special economic zones and export processing zones. The district has accommodated 100s of arts and engineering colleges and many universities. As per as the per capita income is concerned, for many years the district is within top 5 districts in the state.

Many retailers of white goods and readymade garments pointed out that they have invested huge amount on inventory and shop modernization activities; fairly huge budget is also allocated for advertisements – both for local television channels and newspaper insertions. Many of the white goods and garment retail outlets are air-conditioned and the interiors are typical to that of the leading outlets in Chennai.

The servicing setup also changed to modern organisational setups, where the sales persons are given with uniforms, and customer service professionals also appointed by many outlets. The retailer association concluded that a research might through light on this issue and suitable action plan might be drawn upon to bring back the glory of retail industry in the district. The President of the association has decided to contact research agency. If you are the research agency, what is your research proposal for Kanchipuram White goods and garments retailers association?

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