Subject: -Marketing Research
Class – BBA II year

	SYLLABUS
UNIT -1	Definition, Concept and Objectives of Marketing research. Advantages and limitations of Marketing Research. Problems and precautions in Marketing research. Analyzing Competition and Consumer Markets, Market Research Methodology.
UNIT -2	Types of Marketing Research: Consumer Research, product research, sales research, and advertising research. Various Issue involved and ethics in marketing research. Rural Marketing Research, Institutional Management & Research.
UNIT -3	Problem formulation and statement of research, Research process, research design - exploratory research, descriptive research andexperimental research designs. Decision Theory and decision Tree.
UNIT -4	Methods of data collection - observational and survey methods. Questionnaire, Design attitude measurement techniques.
UNIT -5	Administration of surveys, sample design, selecting an appropriate statistical technique. Tabulation and analysis of data, scaling techniques. Hypothesis, Concept, Need, Objectives of the hypotheses, Types of Hypotheses and its uses. Report writing.

Unit-I

Introduction to market research

To run a successful business, it is essential that you know who your customers are, what they need, and how to reach them. Market research can help you get accurate and specific information about your customers and competitors, which is a critical part of starting or expanding your business. Consumer demands impact and direct all aspects of your company's activities and can determine the success or failure of your business.

WHY CONDUCT MARKET RESEARCH?

The environment that your business operates in can be very dynamic. Shifts in economic conditions, demographic changes, new regulations and changes in technology can all affect the way you do business.

Market research can help you:

- better understand the characteristics and preferences of your customers
- identify opportunities to increase sales and grow your business
- monitor the level of competition in your market
- reduce the risk in your business decisions
- develop and complete your business plan

Established businesses thinking about making significant changes, like business expansion or relocation, can also use market research to support their decisions. Some other common situations that might call for market research include:

- launching a new advertising campaign
- increasing production or stock levels
- introducing new lines of products or services

HOW TO CONDUCT MARKET RESEARCH

Before you start, establish clear goals for the market research activity you will undertake. You should define what you need to know and why.

Once you have established your goals, develop a strategy and select the techniques you will use to gather data. The two broad types of research you can use are primary and secondary research:

- **Primary research** consists of data collected directly from potential customers through surveys, focus groups, field testing, etc. You can do the research yourself or hire a company to do it for you. If you complete the research yourself, you keep the costs down and have the added benefit of getting to know the market for your business.

A drawback of primary research is that it can be time consuming and expensive, particularly if you are hiring a marketing firm to conduct the research. The benefits are that you can target specific groups (such as your customers or the geographic market for your business) and tailor the study to answer specific questions.

- **Secondary research** involves searching existing information that has already been collected, such as demographic data and industry statistics, and using it in your own business or marketing plan.

Secondary research uses existing resources like company records, surveys, research studies and books. It is normally less time consuming than primary research, and can be less expensive.

While secondary research is less targeted than primary research, it can still yield valuable information.

The following are examples of questions that can be addressed through secondary research:

- What are the current economic conditions, and are they changing?
- What are the industry trends?
- Are there international markets for my product or service?
- Who are my customers? (Population, age group, income levels, where they live, etc.)
- What is the state of the labour market?

Another key secondary resource is statistical data from official statistics providers, associations and private organizations.

WHAT DO I NEED TO KNOW?

When conducting research there are some questions you may want to answer, and primary or secondary research will help you find the answers. Some of the questions you can consider include:

- **Who is My Customer?**
  Knowing who your customer is will help you choose a location, establish pricing, and plan a selling strategy. Ask yourself: Who will buy my product? What are my customer's habits and preferences?
- **Is There a Demand for My Product/Service?**
  Make sure that your product or service is meeting the needs of your customers.
- **Who is My Competition?**
  Determine who your major competitors are, try to locate their strengths and weaknesses, and see how your business compares.
- **Where Are My Customers Located?**
  Knowing where your potential customers are located will help you choose a location, what kind of promotions to use, and other marketing strategies. It can also help you learn about changes in your industry and how those changes could impact sales.
- **What Will I Charge?**
  The goal for your business is to maximize your profits while remaining competitive. Pricing can play a large part in the success of your business, so you will want to consider what your competitors are charging for similar products and services and if you can maintain your prices over time.
- **How Should I Promote My Product/Service?**
  Ensure that you are using the most effective methods to promote your business. When deciding on a promotional strategy consider what your competitors are doing and what kind of media would best suit your customer (for example, online media for a teen market).

Finding the data that can help you with your business decisions can be difficult, and some of the data can be expensive to purchase. There are, however, a number of affordable statistical and analytical resources available to you, as well as guidance to help you make sense of all the materials available.

The Research and Statistics section of the Canada Business website offers a number of categorized links to data and analytical resources, many of which are free to access. Other sources of secondary research materials include libraries, universities, industry associations and government departments.

Advantages of Marketing Research:

i. Marketing research helps the management of a firm in planning by providing accurate and up- to-date information about the demands, their changing tastes, attitudes, preferences, buying

ii. It helps the manufacturer to adjust his production according to the conditions of demand.

iii. It helps to establish correlative relationship between the product brand and consumers' needs and preferences.

iv. It helps the manufacturer to secure economies in the distribution o his products.

v. It makes the marketing of goods efficient and economical by eliminating all type of wastage.

vi. It helps the manufacturer and dealers to find out the best way of approaching the potential

vii. It helps the manufacturer to find out the defects in the existing product and take the required corrective steps to improve the product.

viii. It helps the manufacturer in finding out the effectiveness of the existing channels of distribution and in finding out the best way of distributing the goods to the ultimate consumers.

ix. It guides the manufacturer in planning his advertising and sales promotion efforts.

x. It is helpful in assessing the effectiveness of advertising programmes.

xi. It is helpful in evaluating the relative efficiency of the different advertising media.

xii. It is helpful in evaluating selling methods.

xiii. It reveals the causes of consumer resistance.

xiv. It minimizes the risks of uncertainties and helps in taking sound decisions.

xv. It reveals the nature of demand for the firm's product. That is, it indicates whether the demand for the product is constant or seasonal.

xvi. It is helpful in ascertaining the reputation of the firm and its products.

xvii. It helps the firm in determining the range within which its products are to be offered to the consumers. That is, it is helpful in determining the sizes, colors, designs, prices, etc., of the products of the firm.

xviii. It would help the management to know how patents, licensing agreements and other legal restrictions affect the manufacture and sale of the firm's products.

xix. It is helpful to the management in determining the actual prices and the price ranges.

xx. It is helpful to the management in determining the discount rates.

xxi. It is helpful to the management in ascertaining the price elasticity for its products.

xxii. It helps the firm in knowing the marketing and pricing strategy of competitors.

xxiii. It is helpful in knowing the general conditions prevailing in the mark

xxiv. It is helpful to the management in finding out the size of the market for its products.

PROBLEMS IN CONDUCTING MARKETING RESEARCH IN INDIA

Though most organizations started recognizing the importance of Marketing Research in Decision Making, it has its own inherent limitations. There are many problems in conducting marketing research in India. The following points elaborate these problems in detail.

1. Non - Availability of Data:

Marketing Research depends on both primary and secondary sources of data. Primary data should be considered only as a last resort. But data collected through secondary sources is very meager and inadequate. Even if data are available mostly it is outdated as the agencies make inordinate delays in gathering and publishing data. To cite an example, despite the best efforts of Government of India through computerization there are inordinate delays in publishing census reports and data becomes redundant by the time they publish.

2. Lack of Trained Enumerators:

Data collection is a specialized job. Marketing Research heavily depends on data collection and analysis. owing to scarcity of trained enumerators reliable data is becoming a scarce. Even if data is available its reliability is highly questionable because the data is not collected scientifically.

3. Problems of Primary Data:

As primary data collection has a limited purpose; these statistics cannot be used repeatedly. They are confined to smaller geographical area and serves limited purpose. These primary studies conducted at different locations can't be strictly comparable for decision making and they may give conflicting results due to divergent methodologies used in different studies. These studies are scattered, not reliable & mostly unorganized.

4. Non-Cooperation of Respondents:

Most Respondents don't respond to the surveys. If at all they agree to furnish information, they don't involve in the survey and mechanically they just furnish information without knowing the implications. Non- cooperation from respondents is really a limiting factor on the reliability of results of Marketing Research.

5. Lack of Trust:

Most respondents do not respond with a fear that the crucial information collected from respondents is misused, more so certain confidential information. This is because of lack of trust on the part of respondents

6. Abuse of Respondents Information:

It has become a practice to abuse crucial lots of the data gathered for the purpose. To cite an example, a credit card holder gets information from many other sales organizations promoting their products and services. Credit card issuing Agencies sell this information to other related
business units and inturn they use this information to promote their products for commercial use.

7. Lack of Professionalism:

Most organizations even today feel that Marketing Research is a luxury. Companies are not willing to invest in Marketing Research as it does not give quick and direct results. Companies believe in their intuition. In small business units & family run businesses, Marketing Research does not play a greater role.

8. Lack of Integrated Approach:

Marketing Research should be integrated with marketing function. But in most cases Marketing Research is separated with that of marketing. Even if Marketing Research is used it is used as a piecemeal approach and not with an integration of other functions and also not on a continuous basis. It happens mostly as a onetime activity and crisis management activity.

9. Expensive ::

Marketing Research needs huge sums and the results are only indicative, informative and approximates. They are not accurate. Marketing Research does not solve the problem. It may help in creating alternative possible solutions to the problem. In most of the cases, it is proved that the costs are disproportionately higher than the benefits that accrue to the firms.

10. It Involves Precious Time & Money:

It is a laborious work and consumes lots of time and may not end up in any reliable and fruitful results despite committing valuable resources, efforts and time.

ANALYZING THE COMPETITORS

1. Determine who your competitors are.

First, you'll need to figure out who you're really competing with so you can compare the data accurately. What works in a business similar to yours may not work for your brand.

So how can you do this?

Divide your "competitors" into two categories: direct and indirect.

Direct competitors are businesses that offer a product or service that could pass as a similar substitute for yours, and that operate in your same geographic area.

On the flip side, an indirect competitor provides products that are not the same but could satisfy the same customer need or solve the same problem.

It seems simple enough on paper, but these two terms are often misused.

When comparing your brand, you should only focus on your direct competitors. This is something many brands get wrong.

Let's use an example: Stitch Fix and Fabletics are both subscription-based services that sell clothes on a monthly basis and serve a similar target audience.

But as we look deeper, we can see that the actual product (clothes in this case) are not the same; one brand focuses on stylish everyday outfits while the other is workout-centric attire only.

Yes, these brands satisfy the same need for women (having trendy clothes delivered right to their doorstep each month), but they do so with completely different types of clothing, making them indirect competitors.

This means Kate Hudson's team at Fabletics would not want to spend their time studying Stitch Fix too closely since their audiences probably vary quite a bit. Even if it's only slightly, this tiny variation is enough to make a big difference.

Now, this doesn't mean you should toss your indirect competitors out the window completely.

Keep these brands on your radar since they could shift positions at any time and cross over into the direct competitor zone. Using our example, Stitch Fix could start a workout line, which would certainly change things for Fabletics.

This is also one of the reasons why you'll want to routinely run a competitor analysis. The market can and will shift at any time, and if you're not constantly scoping it out, you won't be aware of these changes until it's too late.

2. Determine what products your competitors offer.

At the heart of any business is its product or service, which is what makes this a good place to start.

You'll want to analyze your competitor's complete product line and the quality of the products or services they're offering.

You should also take note of their pricing and any discounts they're offering customers.

Some questions to consider include:

- Are they a low-cost or high-cost provider?
- Are they working mainly on volume sales or one-off purchases?
- What is their market share?
- What are the characteristics and needs of their ideal customers?
- Are they using different pricing strategies for online purchases versus brick and mortar?
- How does the company differentiate itself from its competitors?
- How do they distribute their products/services?

3. Research your competitors' sales tactics and results.

Running a sales analysis of your competitors can be a bit tricky.

You'll want to track down the answers to questions such as:

- What does the sales process look like?
- What channels are they selling through?
- Do they have multiple locations and how does this give them an advantage?
- Are they expanding? Scaling down?
- Do they have partner reselling programs?
- What are their customers' reasons for not buying? For ending their relationship with the company?
- What are their revenues each year? What about total sales volume?
- Do they regularly discount their products or services?
- How involved is a salesperson in the process?

These helpful pieces of information will give you an idea of how competitive the sales process is, and what information you need to prepare your sales reps with to compete during the final buy stage.

For publicly held companies, you can find annual reports online, but you'll have to do some sleuthing to find this info from privately owned businesses.

You could find some of this information by searching through your CRM and reaching out to those customers who mentioned they were considering your competitor. Find out what made them choose your product or service over others out there.

To do this, run a report that shows all prospective deals where there was an identified competitor.

If this data is not something you currently record, talk to marketing and sales to implement a system where prospects are questioned about the other companies they are considering.

Essentially, they'll need to ask their leads (either through a form field or during a one-on-one sales conversation) to identify who their current service providers are, who they've used in the past, and who else they are considering during the buying process.

When a competitor is identified, have your sales team dive deeper by asking why they are considering switching to your product. If you've already lost the deal, be sure to follow up with the prospect to determine why you lost to your competitor. What services or features attracted the prospect? Was it about price? What's the prospect's impression of your sales process? If they've already made the switch, find out why they made this decision.

By asking open-ended questions, you'll have honest feedback about what customers find appealing about your brand and what might be turning customers away.

Once you've answered these questions, you can start scoping out your competitor's marketing efforts.

4. Take a look at your competitors' pricing, as well as any perks they offer.

There are a few major factors that go into correctly pricing your product — and one major one is understanding how much your competitors are charging for a similar product or service.

If you feel your product offers superior features compared to those of a competitor, you might consider making your product or service more expensive than industry standards. However, if you do that, you'll want to ensure your sales reps are ready to explain why your product is worth the additional cost.

Alternatively, perhaps you feel there's a gap in your industry for affordable products. If that's the case, you might aim to charge less than competitors and appeal to prospects who aren't looking to break the bank for a high-quality product.

Of course, other factors go into 1. Determine who your competitors are.

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5. Ensure you're meeting competitive shipping costs.

Did you know expensive shipping is the number one reason for cart abandonment?

Nowadays, free shipping is a major perk that can attract consumers to choose one brand over another. If you work in an industry where shipping is a major factor — like ecommerce — you'll want to take a look at competitors' shipping costs and ensure you're meeting (if not exceeding) those prices.

If most of your competitors' offer free shipping, you'll want to look into the option for your own company. If free shipping isn't a practical option for your business, consider how you might differentiate in other ways — including loyalty programs, holiday discounts, or giveaways on social media.

6. Analyze how your competitors market their products.

Analyzing your competitor's website is the fastest way to gauge their marketing efforts. Take note of any of the following items and copy down the specific URL for future reference:

Do they have a blog?

Are they creating whitepapers or eBooks?

Do they post videos or webinars?

Do they have a podcast?

Are they using static visual content such as infographics and cartoons?

What about slide decks?

Do they have a FAQs section?

Are there featured articles?

Do you see press releases?

Do they have a media kit?

What about case studies?

Do they publish buying guides and data sheets?

What online and offline advertising campaigns are they running?

7. Take note of your competition's content strategy.

Then, take a look at the quantity of these items. Do they have several hundred blog posts or a small handful? Are there five white papers and just one ebook?

Next, determine the frequency of these content assets. Are they publishing something new each week or once a month? How often does a new ebook or case study come out?

Chances are if you come across a robust archive of content, your competitor has been publishing regularly. Depending on the topics they're discussing, this content may help you hone in on their lead-generating strategies.

From there, you should move on to evaluating the quality of their content. After all, if the quality is lacking, it won't matter how often they post since their target audience won't find much value in it.

Choose a small handful of samples to review instead of tackling every single piece to make the process more manageable.

Your sampler should include content pieces covering a variety of topics so you'll have a fairly complete picture of what your competitor shares with their target audience.

When analyzing your competitor's content, consider the following questions:

How accurate is their content?

Are spelling or grammar errors present?

How in-depth does their content go? (Is it at the introductory level that just scratches the surface or does it include more advanced topics with high-level ideas?)

What tone do they use?

Is the content structured for readability? (Are they using bullet points, bold headings, and numbered lists?)

Is their content free and available to anyone or do their readers need to opt-in?

Who is writing their content? (In-house team? One person? Multiple contributors?)

Is there a visible byline or bio attached to their articles?

As you continue to scan the content, pay attention to the photos and imagery your competitors are using.
Do you quickly scroll past generic stock photos or are you impressed by custom illustrations and images? If they're using stock photos, do they at least have overlays of text quotes or calls-to-action that are specific to their business?
If their photos are custom, are they sourced from outside graphic professionals or do they appear to be done in-house?
When you have a solid understanding of your competitor's content marketing strategy, it's time to find out if it's truly working for them.

8. Learn what technology stack your competitors' use.

Understanding what types of technology your competitors' use can be critical for helping your own company reduce friction and increase momentum within your organization.
For instance, perhaps you've seen positive reviews about a competitor's customer service — as you're conducting research, you learn the customer uses powerful customer service software you haven't been taking advantage of. This information should arm you with the opportunity to outperform your competitors' processes.
To figure out which software your competitors' use, type the company's URL into Built With, an effective tool for unveiling what technology your competitors' site runs on, along with third-party plugins ranging from analytics systems to CRMs.
Alternatively, you might consider looking at competitors' job listings, particularly for engineer or web developer roles. The job listing will likely mention which tools a candidate needs to be familiar with — a creative way to gain intel into the technology your competitors' use.

9. Analyze the level of engagement on your competitor's content.

To gauge how engaging your competitor's content is to their readers, you'll need to see how their target audience responds to what they're posting.
Check the average number of comments, shares, and likes on your competitor's content and find out if:
Certain topics resonate better than others

The comments are negative, positive, or a mix

People are tweeting about specific topics more than others

Readers respond better to Facebook updates about certain content

Don't forget to note if your competitor categorizes their content using tags, and if they have social media follow and share buttons attached to each piece of content.

10. Observe how they promote their marketing content.

From engagement, you'll move right along to your competitor's content promotion strategy.

11. Look at their social media presence, strategies, and go-to platforms

The last area you'll want to evaluate when it comes to marketing is your competitor's social media presence and engagement rates.

How does your competition drive engagement with their brand through social media? Do you see social sharing buttons with each article? Does your competitor have links to their social media channels in the header, footer, or somewhere else? Are these clearly visible? Do they use calls-to-action with these buttons?

If your competitors are using a social network that you may not be on, it's worth learning more about how that platform may be able to help your business, too. To determine if a new social media platform is worth your time, check your competitor's engagement rates on those sites. First, visit the following sites to see if your competition has an account on these platforms:

- Facebook
- Twitter
- Instagram
- Snapchat
- LinkedIn
- YouTube
- Pinterest

Then, take note of the following quantitative items from each platform:
Number of fans/followers

Posting frequency and consistency

Content engagement (Are users leaving comments or sharing their posts?)

Content virality (How many shares, repines, and retweets do their posts get?)

With the same critical eye you used to gauge your competition's content marketing strategy, take a fine-toothed comb to analyze their social media strategy.

What kind of content are they posting? Are they more focused on driving people to landing pages, resulting in new leads? Or are they posting visual content to promote engagement and brand awareness?

How much of this content is original? Do they share curated content from other sources? Are these sources regular contributors? What is the overall tone of the content?

How does your competition interact with its followers? How frequently do their followers interact with their content?

After you collect this data, generate an overall grade for the quality of your competitor's content. This will help you compare the rest of your competitors using a similar grading scale.

12. **Perform a SWOT Analysis to learn their strengths, weaknesses, opportunities, and threats**

As you evaluate each component in your competitor analysis (business, sales, and marketing), get into the habit of performing a simplified SWOT analysis at the same time.

This means you'll take note of your competitor's strengths, weaknesses, opportunities, and threats any time you assess an overall grade.

Some questions to get you started include:

- What is your competitor doing well? (Products, content marketing, social
- Where does your competitor have the advantage over your brand?
- What is the weakest area for your competitor?
- Where does your brand have the advantage over your competitor?
- What could they do better with?

In what areas would you consider this competitor a threat?

Are there opportunities in the market that your competitor has identified?

You'll be able to compare their weaknesses against your strengths and vice versa. By doing this, you can better position your company, and you'll start to uncover areas for improvement within your own brand.

RESEARCH METHODOLOGY

WHAT IS RESEARCH METHODOLOGY?

Research methodology is a way of explaining how a researcher intends to carry out their research. It's a logical, systematic plan to resolve a research problem. A methodology details a researcher's approach to the research to ensure reliable, valid results that address their aims and objectives. It encompasses what data they're going to collect and where from, as well as how it's being collected and analyzed.

WHY IS A RESEARCH METHODOLOGY IMPORTANT?

A research methodology gives research legitimacy and provides scientifically sound findings. It also provides a detailed plan that helps to keep researchers on track, making the process smooth, effective and manageable. A researcher's methodology allows the reader to understand the approach and methods used to reach conclusions.

Having a sound research methodology in place provides the following benefits:

Other researchers who want to replicate the research have enough information to do so.

Researchers who receive criticism can refer to the methodology and explain their approach.

It can help provide researchers with a specific plan to follow throughout their research.

The methodology design process helps researchers select the correct methods for the objectives.

It allows researchers to document what they intend to achieve with the research from the outset.

MEANING & TYPES OF RESEARCH

Meaning:

1) Gathering and analyzing a body of information or data and **extracting new meaning** from it or **developing unique solutions** to problems or cases.

2) A **report** or **review**, not designed to create new information or insight but to collate and synthesize existing information.
3) A search for **individual facts or data**. May be part of the search for a solution to a larger problem

Types :

There are two types of research which can be done to develop a thesis or dissertation:

1) **Practical Research:** The practical approach consists of the empirical study of the topic under research and chiefly consists of hands on approach. This involves first hand research in the form of questionnaires, surveys, interviews, observations and discussion groups.
2) **Theoretical Research:** A non empirical approach to research, this usually involves perusal of mostly published works like researching through archives of public libraries, court rooms and published academic journals.
3) **Descriptive/Qualitative**: This type of research methods involve describing in details specific situation using research tools like interviews, surveys, and Observations. It focuses on gathering of mainly verbal data rather than measurements.
4) **Descriptive/Quantitative**: This type of research methods requires quantifiable data involving numerical and statistical explanations. Quantitative analysis hinges on researchers understanding the assumptions inherent within different statistical models. It generates numerical data or information that can be converted into numbers. The presentation of data is through tables containing data in the form of numbers and statistics.

Advantages of Marketing Research

1. **Indicates current market trends** : Marketing research keeps business unit in touch with the latest market trends and offers guidance for facing market situation with confidence. It facilitates production as per consumer demand and preferences.
2. **Pinpoints deficiencies in marketing policies** : MR pinpoints the deficiencies as regards products, pricing, promotion, etc. It gives proper guidance regarding different aspects of marketing. They include product development, branding, packaging and advertising.
3. **Explains customer resistance** : MR is useful for finding out customer resistance to company's products. Suitable remedial measures are also suggested by the researcher to deal with the situation. This makes the products agreeable to the consumers.
4. **Suggests sales promotion techniques** : Marketing research enables a manufacturer to introduce appropriate sales promotion techniques, select most convenient channel of distribution, suitable pricing policy for the products and provision of discounts and concessions to dealers. It facilitates sales promotion.
5. **Guidance to marketing executives** : Marketing research offers information and guidance to marketing executives while framing marketing policies. Continuous research enables a company to face adverse marketing situation boldly. It acts as an insurance against possible changes in market environment.
6. **Selection and training of sales force** : Marketing research is useful for the selection and training of staff in the sales Organisation. It suggests the incentives which should be offered for motivation of employees concerned with marketing.
7. **Facilitates business expansion** : Marketing research enables a business unit to grow and expand its activities. It creates goodwill in the market and also enables a business unit to earn high profits through consumer-oriented marketing policies and programmes.
8. **Facilitates appraisal of marketing policies** : Research activities enable marketing executives to have an appraisal of the present marketing policies in the fight of research findings. Suitable adjustments in the policies are also possible as per the suggestions made.

9. **Suggests marketing opportunities** : Marketing research suggests new marketing opportunities and the manner in which they can be exploited fully. It identifies existing and emerging market opportunities.
10. **Facilitates inventory study** : Marketing research is useful for the evaluation of company's inventory policies and also for the introduction of more efficient ways of managing inventories including finished goods and raw materials.
11. **Provides marketing information** : MR provides information on various aspects of marketing. It suggests relative strengths and weaknesses of the company. On the basis of such information, marketing executives find it easy to frame policies for the future period. MR provides information, guidance and alternative solutions to marketing problems.
12. **Suggests distribution channels** : Marketing research can be used to study the effectiveness of existing channels of distribution and the need of making suitable changes in the distribution system.
13. **Creates progressive outlook** : Marketing research generates a progressive and dynamic outlook throughout the business Organisation. It promotes systematic thinking and a sense of professionalisation within the company. It also creates enthusiasm among executives concerned with marketing. This brings success and stability to the whole business unit.
14. **Social significance** : Marketing research is of paramount importance from the social angle. It acts as a means by which the ultimate consumer literally becomes king of the market place.

Sources of data: primary & secondary data Primary Data:

Raw data (also known as primary data) is a term for data collected from a source. Raw data has not been subjected to processing or any other manipulation, and are also referred to as primary data.

Sources of primary data:

Primary data is the data collected by the researcher themselves, i.e.

1. interview
2. observation
3. action research
4. case studies
5. life histories
6. questionnaires
7. ethnographic research
8. longitudinal studies

Advantages of Primary data:

1) **Targeted Issues are addressed.** The organization asking for the research has the complete control on the process and the research is streamlines as far as its objectives and scope is concerned. Researching company can be asked to concentrate their efforts to find data regarding specific market rather than concentration on mass market.

2) **Data interpretation is better.** The collected data can be examined and interpreted by the marketers depending on their needs rather than relying on the interpretation made by collectors of secondary data.

3) **Fresh/Recent Data.** Usually secondary data is not so recent and it may not be specific to the place or situation marketer is targeting. The researcher can use the irrelevant seeming information for knowing trends or may be able to find some relation with the current scenario. Thus primary data becomes a more accurate tool since we can use data which is useful for us.

4) **Proprietary Issues**. Collector of primary data is the owner of that information and he need not share it with other companies and competitors. This gives an edge over competitors replying on secondary data.

Disadvantages of Primary data:

1) **High Cost.** Collecting data using primary research is a costly proposition as marketer has to be involved throughout and has to design everything.

2) **Time Consuming.** Because of exhaustive nature of the exercise, the time required to do research accurately is very long as compared to secondary data, which can be collected in much lesser time duration.

3) **Inaccurate Feed-backs.** In case the research involves taking feedbacks from the targeted audience, there are high chances that feedback given is not correct. Feedbacks by their basic nature are usually biased or given just for the sake of it.

4) **More number of resources are required**. Leaving aside cost and time, other resources like human resources and materials too are needed in larger quantity to do surveys and data collection.

Secondary Data:

Secondary data, is data collected by someone other than the user. Common sources of secondary data for social science include censuses, organisational records and data collected through qualitative methodologies or qualitative research. Primary data, by contrast, are collected by the investigator conducting the research.

Sources of secondary data:

Secondary sources are data that already exists

1. Previous research
2. Official statistics
3. Mass media products
4. Diaries
5. Letters
6. Government reports
7. Web information
8. Historical data and information

Advantages of secondary data :

1) **Ease of Access:** There are many advantages to using secondary research. This includes the relative ease of access to many sources of secondary data. In the past secondary data accumulation required marketers to visit libraries, or wait for reports to be shipped by mail. Now with the availability of online access, secondary research is more openly accessed. This offers convenience and generally standardized usage methods for all sources of secondary research.
2) **Low Cost to Acquire**
The use of secondary data has allowed researchers access to valuable information for little or no cost to acquire. Therefore, this information is much less expensive then if the researchers had to carry out the research themselves.
3) **Clarification of Research Question**
The use of secondary research may help the researcher to clarify the research question. Secondary research is often used prior to primary research to help clarify the research focus.
4) **May Answer Research Question**
The use of secondary data collection is often used to help align the focus of large scale primary research. When focusing on secondary research, the researcher may realize that the exact information they were looking to uncover is already available through secondary sources. This would effectively eliminate the need and expense to carry out there own primary research.
5) **May Show Difficulties in Conducting Primary Research**
In many cases, the originators of secondary research include details of how the information was collected. This may include information detailing the procedures used in data collection and difficulties encountered in conducting the primary research. Therefore, the detailed difficulties may persuade the researcher to decide that the potential information obtained is not worth the potential difficulties in conducting the research.

Disadvantages of secondary data :

1) **Quality of Research**
   There are some disadvantages to using secondary research. The originators of the primary research are largely self-governed and controlled by the marketer. Therefore, the secondary research used must be scrutinized closely since the origins of the information may be questionable. Moreover, the researcher needs to take sufficient steps to critically evaluate the validity and reliability of the information provided.
2) **Not Specific to Researcher's Needs**
   In many cases, secondary data is not presented in a form that exactly meets the researcher's needs. Therefore, the researcher needs to rely on secondary data that is presented and classified in a way that is similar to their needs.
3) **Incomplete Information**
   In many cases, researchers find information that appears valuable and promising. The researcher may not get the full version of the research to gain the full value of the study. This is because many research suppliers offer free portions of their research and then charge expensive fees for their full reports.
4) **Not Timely**
   When using secondary research, one must exercise caution when using dated information from the past. With companies competing in fast changing industries, an out-of-date research reports many have little or no relevance to the current market situation.

Unit 2

Types of Marketing Research

Consumer Research

Consumer research is a part of market research in which inclination, motivation and purchase behavior of the targeted customers are identified. Consumer research helps businesses or organizations understand customer psychology and create detailed purchasing behavior profiles.

It uses research techniques to provide systematic information about what customers need. Using this information brands can make changes in their products and services, making them more customer-centric thereby increasing customer satisfaction. This will in turn help to boost business.

Consumer research, also known as market research or consumer insights research, is defined as the process of collecting and analyzing information about consumers' preferences, behaviors, and attitudes toward products, services, brands, or market trends. This type of research is essential for businesses and organizations to make informed decisions about their marketing strategies, product development, and overall business planning. Consumer research helps companies understand their target audience, identify market opportunities, and stay competitive in the marketplace.

Here are some key aspects of consumer research:

- **Understanding Consumer Behavior**: Consumer researchers aim to uncover how consumers make purchasing decisions, what factors influence their choices, and how they use products or services. This information can be used to predict future behavior and tailor marketing efforts accordingly.
- **Market Segmentation:** Consumer research often involves segmenting the market into distinct groups based on demographics, psychographics, or other criteria. This allows businesses to target specific customer segments with tailored marketing messages and products.
- **Product Development:** By conducting consumer research, companies can gather insights into what features or improvements consumers desire in products and services. This helps in designing and developing products that meet customer needs and preferences.
- **Competitive Analysis**: Consumer research also involves analyzing the competition, understanding their strengths and weaknesses, and identifying opportunities to differentiate one's own products or services in the market.
- **Customer Satisfaction:** Companies use consumer research to assess customer satisfaction and identify areas for improvement. This has the potential to result in improved customer experiences and heightened customer loyalty.
- **Trend Analysis:** Researchers monitor market trends, consumer sentiment, and emerging technologies to help businesses stay ahead of the curve and adapt to changing consumer preferences.

Key Methods in Consumer Research

To conduct effective consumer research, various methods and techniques are employed. These methods can be broadly categorized into two main approaches: quantitative and qualitative research.

- **Quantitative Research in Consumer Studies**

Quantitative research focuses on gathering numerical data and statistical analysis. It often involves surveys, questionnaires, and structured interviews with a large sample of participants. This method provides numerical insights into consumer behaviors, preferences, and trends. Data collected through quantitative research can be analyzed to identify patterns, correlations, and statistical significance. This approach is particularly useful when a business needs to measure consumer satisfaction, evaluate the effectiveness of marketing campaigns, or conduct large-scale market studies.

- **Qualitative Approaches in Consumer Research**

Qualitative research, on the other hand, emphasizes understanding the underlying motivations and emotions behind consumer behaviors. It involves methods like focus groups, in-depth interviews, and observational studies. Qualitative research allows researchers to delve deeper into consumers' thoughts, feelings, and experiences. It helps businesses gain a more nuanced understanding of their target audience, enabling them to develop products and marketing strategies that resonate on a deeper level.

Exploring Types of Consumer Research

Consumer research is a multifaceted field with various types, each serving specific purposes:

1. **Demographic Analysis in Consumer Research** Demographic research involves analyzing data related to consumers' age, gender, income, education, and other demographic factors. This type of research helps businesses identify and target specific consumer groups based on their characteristics and preferences.
2. **Psychographic Research Methods** Psychographic research focuses on consumers' lifestyles, values, interests, and personality traits. By understanding the psychological factors that influence consumer behavior, businesses can tailor their marketing strategies to align with consumers' beliefs and aspirations.
3. **Consumer Insight Generation** Consumer insight research aims to uncover unique and valuable insights about consumer behaviors and preferences. It often involves innovative data collection techniques and advanced analytics to discover hidden trends and opportunities.
4. **Brand Perception Research** Brand perception research assesses how consumers perceive a brand and its products or services. It helps businesses understand the strengths and weaknesses of their brand image and make necessary improvements.
5. **Product Testing in Consumer Studies** Product testing involves gathering consumer feedback on new products or prototypes. This research type helps businesses refine their products based on real-world consumer input, ensuring they meet market demands.
6. **Comparative Consumer Analysis** Comparative research involves evaluating a business's performance relative to its competitors. It helps identify areas where a business can gain a competitive edge and better serve its target audience.
7. **Cross-Cultural Consumer Research** Cross-cultural research examines consumer behaviours and preferences across different cultures and regions. It helps businesses adapt their marketing strategies to diverse consumer demographics.

Ethical Considerations in Consumer Research

While consumer research provides valuable insights, it is essential to conduct it ethically and responsibly. Respecting consumers' privacy and ensuring the security of their data should be paramount. Businesses should obtain informed consent, anonymize data when necessary, and adhere to applicable regulations, such as GDPR or CCPA, to protect consumers' rights.

The Evolution of Consumer Research Methods

Consumer research methods have evolved significantly over the years. From traditional face-to-face interviews and paper surveys to online surveys, big data analytics, and AI-driven insights, technology has played a pivotal role in enhancing the effectiveness and efficiency of consumer research. Businesses must stay current with the latest research tools and techniques to remain competitive in today's fast-paced market.

The consumer research process can be broken down into the following steps:

1. **Develop research objectives:** The first step to the consumer research process is to clearly define the research objective, the purpose of research, why is the research being conducted, to understand what? A clear statement of purpose can help emphasize the purpose.
2. **Collect Secondary data:** Collect secondary data first, it helps in understanding if research has been conducted earlier and if there are any pieces of evidence related to the subject matter that can be used by an organization to make informed decisions regarding consumers.
3. **Primary Research:** In primary research organizations or businesses collect their own data or employ a third party to collect data on their behalf. This research makes use of various data collection methods (qualitative and quantitative) that helps researchers collect data first hand.
4. **Collect and analyze data:** Data is collected and analyzed and inference is drawn to understand consumer behavior and purchase pattern.
5. **Prepare report:** Finally, a report is prepared for all the findings by analyzing data collected so that organizations are able to make informed decisions and think of all probabilities related to consumer behavior. By putting the study into practice, organizations can become customer-centric and manufacture products or render services that will help them achieve excellent customer satisfaction.

Product research

Product research is a process in which you gather, analyze, and interpret data to make strategic decisions about a product's or feature's development, improvement, or market positioning. It is a crucial part of the design and development process, whether for a new product or adding features to an existing one.

Product research helps evaluate market demand, analyze conditions and competition, and identify your target audience's needs, expectations, and pain points. The goal is to create products that meet user needs, reduce risks, and enhance user satisfaction.

Product research is essential before and after a product launch to ensure continuous improvement and alignment with market trends and customer preferences.

Types of product research

Product research has different facets depending on which stage of development you are, and what kind of insights you need. They all have a lot in common, but the focus angle will be different. 🔦

- **Market research** focuses on evaluating the market size, trends, competitive landscape, and customer demographics (within one market). It will help you assess whether your product has a chance to succeed on the intended market, identify opportunities, and optimize your overall product and marketing strategies.
- **Customer research** aims to understand customers' needs, preferences, behaviors, and experiences. Only then can you create products that meet their expectations and solve their problems.
- **User research** studies how users interact with a product to make sure it is user-friendly and meets *real* user needs. Its main focus is to gather insights on user behaviors, needs, motivations, and pain points to improve user experience and product usability.
- With **product discovery**, you want to identify and validate ideas for new products and features

before development begins. The primary purpose is to minimize risks by validating assumptions and ensuring alignment with user needs and business goals.

- **Continuous product discovery** framework integrates into the daily workflow of product teams. Its main focus is to continuously gather insights from users to validate product assumptions, to ultimately build features that bring value for users but also align with business goals.
- **Pricing research** helps determine the optimal price for your product or service. It involves analyzing market demand, competition, and customer willingness to pay. The goal is to find a price threshold that maximizes revenue and meets market expectations at the same time.

Why do product teams need product research?

To some degree, all product teams need to have a well-established product research process.
Depending on the scope (is it a completely new product, or are you developing new features?) and stage of development (are you assessing your chances in the market or already prototyping?), teams will perform different research activities.
It's never one size fits all, but it's also an indisputable part of developing digital products.

- **To make informed decisions**
  The fundamental reason to do product research is to reduce the risks of failure.
  And even though you might have heard it countless times, you cannot overrate the power of data-driven decisions. Product research provides concrete data, forming a foundation for making them, from feature prioritization to design choices.
- **To identify the problem and validate product ideas**
  Product research will help you uncover what your customers need and desire, as well as the challenges they face.
  With a well-defined problem, it's also easier to test and validate product ideas before you invest significant resources. This again reduces the risk of creating a product that misses the mark.
- **To gain a competitive edge**
  One integral element of product research is understanding your competition's offerings. Analyzing competitor products will help you identify opportunities for differentiation, making sure your product stands out in the crowded market.
  Continuous market research will help you stay abreast of trends and evolving customer needs, ensuring that your product remains relevant.
  Bonus: Customer-centric approach focused on user-centered design will also help you build a positive brand reputation.
- **To optimize product development**
  This one works two ways. First, by conducting thorough product research, you identify areas that need to be prioritized. It enables your teams to focus on aspects that resonate the most with users. Second, you save money. Product research gives you tangible arguments for allocating resources better, thus preventing costly development mistakes.
- **For continuous improvement**
  As the development of digital products never ends but continues through iterations, you need a trend baseline to make sure that your product evolves in the right direction.
  Bonus: Engaging directly with users during research helps develop empathy and improve retention, both of which are crucial for user-centric product development.

Benefits of product research?

Product research offers a multitude of benefits, including identifying and validating product ideas, optimizing product development and gaining a competitive edge, enhanced user satisfaction, and a more targeted approach to marketing.

By gaining a deeper understanding of your target audience and market dynamics, you can align your product with customer expectations and market demands:

1) Identify and validate product ideas:

Discover customer needs and pain points:

Product research helps uncover what customers truly need and the challenges they face. By understanding their pain points, product teams can create solutions that address real-world problems, increasing the likelihood of market acceptance.

Test and refine concepts before development:

Through thorough research, teams can test their product ideas early in the process. This allows for adjustments and refinements before significant resources are invested in development, reducing the risk of creating a product that misses the mark.

Reduce the risk of failure due to poor product-market fit:

By aligning the product with customer needs, teams can ensure a better fit in the market. This minimizes the risk of failure and enhances the chances of success by delivering a product that meets genuine demand.

2) Optimize product development:

Prioritize features and functionalities based on user demand:

Research helps identify the most desired features and functionalities, enabling teams to prioritize development efforts. This ensures that resources are allocated efficiently, focusing on aspects that resonate most with users.

Allocate resources efficiently and avoid costly development mistakes:

Understanding user preferences allows teams to allocate resources effectively, preventing unnecessary expenses. This proactive approach helps avoid costly development mistakes that may arise from misaligned

priorities.

Improve user experience and satisfaction:

By incorporating user feedback and preferences, product research contributes to a better overall user experience. This leads to increased user satisfaction and loyalty, fostering positive relationships between customers and the product.

3) Gain a competitive edge:

Understand competitor offerings and identify differentiation points:

Product research includes analyzing competitor products to understand the market landscape. This insight helps teams identify opportunities for differentiation, ensuring their product stands out in the crowded market.

Stay ahead of market trends and adapt to changing customer needs:

Continuous research enables teams to stay abreast of market trends and evolving customer needs. This adaptability ensures that the product remains relevant and continues to meet customer expectations over time.

Build a stronger brand reputation through customer-centric products:

Developing products based on customer insights fosters a customer-centric approach. This builds a positive brand reputation, as customers appreciate brands that actively listen to their needs and deliver solutions that genuinely enhance their experiences.

Product research methods

Product research employs different methodologies to gather valuable insights.

Quantitative research involves numerical data analysis, while qualitative research delves into the subjective aspects of user experience.

Additionally, secondary research leverages existing data sources, providing a comprehensive understanding of the product landscape.

Let's have a closer look at each one of them:

Quantitative research:

Utilizing numerical data and statistical analysis, quantitative research provides measurable insights into customer preferences and behavior. Surveys, data analytics, and market research reports are common instruments in this approach:

1) Surveys:

Surveys serve as a valuable tool for product teams to gather quantitative data, allowing them to understand customer opinions and experiences. Three commonly used survey metrics are:

CSAT (Customer Satisfaction): Conducting CSAT surveys helps gauge customers' overall satisfaction with a product or service. Teams can use a simple scale, often ranging from "Very Unsatisfied" to "Very Satisfied," to collect feedback and identify areas for improvement.

NPS (Net Promoter Score): NPS measures the likelihood of customers recommending a product to others. Respondents rate their likelihood on a scale from 0 to 10, and based on their responses, they are categorized as promoters, passives, or detractors. This metric provides insight into overall customer loyalty and satisfaction.

CES (Customer Effort Score): CES surveys focus on the ease with which customers can accomplish tasks or resolve issues related to a product. Customers provide feedback on a scale ranging from "Very Difficult" to "Very Easy," helping product teams streamline processes and enhance user experience.

2) Data analytics:

Leveraging data analytics provides product teams with quantitative insights derived from user interactions and behaviors. This method enables teams to make informed decisions based on concrete data. Key aspects include:

User behavior analysis: Examining user interactions within a product helps identify patterns, preferences, and pain points. By analyzing data such as click-through rates, time spent on pages, and feature usage, product teams can refine their strategies and optimize user experiences.
A/B testing: A/B testing involves comparing two versions of a webpage or feature to determine which performs better in terms of user engagement or conversion. Through statistical analysis of user responses, product teams can make data-driven decisions on design elements, content, or functionality.
3) Market research reports:
Market research reports offer a comprehensive overview of the industry landscape, helping product teams understand market trends, competitor activities, and consumer preferences. Key components include:
Industry trends analysis: Examining market research reports provides insights into current and emerging trends within a specific industry. Product teams can use this information to align their offerings with market demands and stay ahead of the competition.
Competitor benchmarking: Market research reports often include detailed analyses of competitors, highlighting their strengths, weaknesses, and market share. This allows product teams to identify areas where they can differentiate themselves and capitalize on market gaps.
Consumer demographics and preferences: Understanding the demographics and preferences of the target audience is crucial for product development. Market research reports provide valuable data on consumer behavior, preferences, and purchasing patterns, enabling product teams to tailor their strategies to meet customer needs.
Qualitative research:
Qualitative research focuses on understanding customer attitudes, motivations, and perceptions. Techniques such as interviews, focus groups, and usability testing are key components of this method:
1) User interviews:
User interviews serve as a fundamental pillar in understanding the end-users' perspectives and needs. By engaging in one-on-one conversations, product teams gain nuanced insights that go beyond surface-level feedback.
Build rapport: Establishing a comfortable environment encourages users to share authentic experiences and thoughts.
Open-ended questions: Frame questions that prompt detailed responses, enabling a deeper understanding of user motivations.
Iterative process: Conducting multiple interviews allows for the validation and refinement of findings, ensuring a comprehensive understanding.
2) Focus groups:
Bringing together a diverse group of users can uncover collective perceptions and preferences. This method fosters dynamic discussions, revealing shared sentiments and potential areas for improvement.
Diverse representation: Ensure participants represent a variety of user demographics to capture a comprehensive range of perspectives.
Moderation skills: Skilled moderators guide discussions effectively, encouraging participants to express their thoughts without bias.
Observational insights: Beyond verbal responses, observing group dynamics can offer valuable non-verbal cues and interactions.
3) Usability testing:
Usability testing places the product directly in the hands of users, evaluating its functionality and intuitiveness. This hands-on approach provides actionable feedback for refining user experiences.
Real-world scenarios: Simulate authentic usage scenarios to observe how users interact with the product

in practical situations.

Task-oriented evaluation: Structure tests around specific tasks, uncovering potential pain points and areas of friction in the user journey.

Continuous iteration: Incorporate feedback iteratively, ensuring that the product evolves to meet user expectations and demands.

4) Surveys:

Surveys offer a scalable way to collect feedback from a large user base. By deploying carefully crafted questionnaires, product teams can gather quantitative and qualitative data efficiently.

Clear and concise questions: Formulate questions that are easy to understand, avoiding ambiguity to elicit accurate responses.

Sampling diversity: Ensure the survey audience reflects the diversity of your user base to capture a broad spectrum of opinions.

Anonymous responses: Encourage honest feedback by assuring users that their responses are anonymous, fostering openness and transparency.

Secondary research:

Drawing on existing data and resources, secondary research involves analyzing information already available, such as industry reports, competitor analysis, and reviews:

1) Industry reports:

Industry reports are comprehensive documents that analyze a specific market segment, providing data on trends, challenges, and opportunities. By studying these reports, product teams can gain a holistic understanding of the market in which they operate.

Identify trends: Industry reports highlight emerging trends that can influence product development. By incorporating these trends, teams can ensure their products stay relevant in a rapidly evolving market.

Market size and growth: Understanding the size and growth of a market is essential. Industry reports provide data on market size, helping product teams assess the potential reach and scalability of their products.

Competitor landscape: Industry reports often include analyses of key players in the market. This insight aids in identifying competitors' strengths and weaknesses, allowing product teams to position their offerings effectively.

2) Competitor analysis:

Examining competitors is a fundamental aspect of product research. By understanding what similar products are available, product teams can identify gaps in the market and develop unique selling propositions.

Product features: Analyzing competitors' product features provides insights into customer preferences. Teams can identify features that resonate with users and incorporate them into their own products.

Pricing strategies: Understanding how competitors price their products helps in setting competitive yet profitable pricing strategies. This analysis ensures that a product is priced appropriately within the market.

Marketing approaches: Studying competitors' marketing approaches allows product teams to identify successful strategies and potential gaps in communication. This insight helps in crafting effective marketing campaigns.

3) Customer reviews:

Customer reviews offer direct feedback from those who have experienced a product. Analyzing these reviews provides valuable insights into customer satisfaction, pain points, and areas for improvement.

Identify pain points: By reading customer reviews, product teams can identify common pain points that users experience with existing products. Addressing these pain points in a new product can create a competitive advantage.

Feature requests: Customers often express their desires for additional features or improvements in

reviews. Product teams can use this information to prioritize development efforts and enhance the product based on user needs.

Competitor strengths and weaknesses: Customer reviews not only provide feedback on a specific product but also shed light on competitors. Understanding what users appreciate or dislike about competing products informs strategic decisions.

As we move forward, we'll pinpoint when it's most beneficial to conduct product research, exploring the different stages of the product development lifecycle.

Sales research

Sales research is the process of gathering, analyzing, and interpreting data about your market, customers, competitors, and sales performance. It can help you identify new opportunities, optimize your sales strategy, and improve your sales results. In this section, we will explore the benefits, methods, and best practices of sales research. We will also provide some examples of how sales research can be applied to different sales scenarios.

Sales research is a process usually by a sales person or department to research all information about the prospects or clients, their service, competition any data that could inform their sales outreach, upsell or focus.

" Sales research is the practice of generating insights from sales data and trends to set targets and forecast future sales performance.

Research should focus on improvement and developing a strategy for improving the sales performance in both the short- and long-term.

Sales research provides information on:

1. The effectiveness of sales methods and techniques
2. Establishing sales territories
3. The adequacy of remuneration methods
4. Sales training requirements

Some of the benefits of sales research are:

- It can help you understand your target market better, such as their needs, preferences, pain points, and buying behavior. This can help you tailor your sales pitch, offer, and value proposition to match their expectations and motivations.
- It can help you segment your market into different groups based on various criteria, such as demographics, psychographics, geography, industry, or behavior. This can help you focus your sales efforts on the most profitable and promising segments, and customize your sales approach for each segment.
- It can help you identify and monitor your competitors, such as their strengths, weaknesses, strategies, and market share. This can help you differentiate yourself from them, find gaps in the market, and anticipate their moves.
- It can help you measure and evaluate your sales performance, such as your sales volume, revenue, profit, conversion rate, customer satisfaction, and retention rate. This can help you track your progress, identify areas of improvement, and set realistic and achievable goals.

Some of the methods of sales research are:

1. Primary research: This involves collecting data directly from your market or customers, such as through surveys, interviews, focus groups, observations, or experiments. This can provide you with first-hand and specific information that is relevant to your sales objectives. However, this method can also be time-consuming, costly, and biased depending on how you design and conduct your research.

2. Secondary research: This involves using data that has been collected by someone else, such as through reports, publications, databases, or websites. This can provide you with general and broad information that can complement your primary research. However, this method can also be outdated, inaccurate, or irrelevant depending on the source and quality of the data.
3. Quantitative research: This involves using numerical data that can be measured, analyzed, and presented using statistics, graphs, or charts. This can provide you with objective and reliable information that can support your sales decisions. However, this method can also be limited, superficial, or misleading depending on the sample size, data collection, and data analysis.
4. Qualitative research: This involves using non-numerical data that can be observed, interpreted, and presented using words, images, or stories. This can provide you with subjective and rich information that can reveal the underlying meanings, emotions, and motivations of your market or customers. However, this method can also be subjective, complex, or difficult to generalize depending on the researcher, data collection, and data analysis.

Advantages of sales research

1) Opportunities:
Sales research of own products as well as competitor products is important as analysing sales of competitors allows insights into the market from a different perspective and may help the company to reach the missed out customers and grab the missed opportunity.

2) Decision driver:
Sales research/analysis acts a decision driver for the company to make major changes in their products. If the Sales of a product are not up to the mark, the company may discontinue the product with immediate effect.

3) Customer Service :
Knowing the reason behind why a particular sales occurred during particular time will help the companies to keep the inventory ready and help them to serve the customers better.
Delighting the customers will, in turn, benefit the company by increased sales further and help to develop goodwill and establish the brand value of the company.

4) Marketing support:
Sales of a certain product may require one-time marketing support or multiple times or seasonal support. Those decisions are taken based on Sales analysis.
For example, products like cough syrup would require marketing and ad campaigns just before and during winter while airline services require constant marketing support.

5) Helps in Insight
As the sales department is involved daily in selling activities, they will have a lot more insight in the demand side of the product. They will be clear in both technical aspect as well as sales aspect.

6) What works and what doesn't
Once the product starts selling, the after sales service says a lot about the quality of the product. And this service report is analyzed by the sales department as well. Hence, the product management can know from their sales as well as service department about which problems are repetitive and need to be resolved.

7) Future requirements
Whenever the product management function takes a feedback, it has to involve sales. This is because the sales department will know very well what kind of differentiation is being expected in the market.
Of course, the product managers have complete authority to design the product as they see fit. But sales has to be involved for complete feedback.

Disadvantages of sales research

1) Reliability:

A lot of times, sales analysis might have been done in a haphazard way or the reasons for the increase in sales of a particular product may go up purely on the effort of the salespersons or offers rolled out. This may have nothing to do with customer or trends and relying on those conclusions can be problematic for the company.

2) Technical knowledge:

High technical knowledge is required for Sales Analysis and not everyone may be suited to do that. Good arithmetic skills along with high market knowledge are basic requirements and those may not be fulfilled by every Salesperson.

3) Cost:

A detailed Sales Analysis along with its interpretation is outsourced by many companies. The dedicated firms or software may be costly which the company would have to bear regularly. Also, the privacy of data would be compromised when sharing the Sales data to the third party.

Importance of sales research

1) Missed opportunities:

Analysing the available data can show the company where it has missed the opportunity and if or not that can be claimed.

Research plays an important role in this by presenting data to compare while the field force will prove of valuable assistance in informing the practicalities of the situation.

2) Future decisions:

Sales data will help a company to take a future decision in terms of inventory management, marketing activities, schemes or offers to be rolled and changes in manufacturing processes if applicable.

Based on Sales data, major decisions like continuing or discontinuing a product is taken. Those future decisions will help the external stakeholders of the company to decide whether or not to invest in the company.

3) Market Trends:

Sales analysis will also show the current market trends to the company while the company may be preparing to launch a new product.

Sales Analysis would show a drastic increase in sales of the earlier product after an activity, showing that it was the lack of awareness which was a hindrance in realizing sales and not the product. Also, sales of a certain product may skyrocket during a festival or decrease seasonally.

4) Customer analysis:

Effectively, sales Analysis is nothing but customer analysis. Answering why did a particular customer buy the product in a particular month may give crucial customer insights which will help with the planning of the company.

5) Detailed analysis:

A detailed Sales Analysis is broken down product wise, customer wise, year and month wise and geography wise is a source of huge information for the company.

Advertising research
Advertising research is the process of gathering, analyzing, and interpreting information related to advertising and marketing strategies. The primary goal of advertising research is to provide insights that can help businesses make informed decisions about their ad campaigns, understand consumer behavior, and optimize the effectiveness of marketing efforts.

Advertising research is the investigative process of market research to optimise the success of your advertising strategy.

Often referred to as ads testing, advertising research determines the success of an ad based on consumer behaviour, feedback, and responses.

Advertising research can be carried out on a campaign-by-campaign basis or it can be done with consistent research that tracks the performance of an ad campaign over time.

Why is Advertising Research Important?
Advertising research validates your ad strategy or identifies shortcomings by testing ad campaigns with a sample of your target audience.
Identify which ads are most likely to resonate with your audience and which may negatively impact your efforts.
Advertising research won't just optimise your ad strategy but also increase conversions and grow your business.
When carried out effectively, advertising research should help you:

- Understand your target audience
- Select the best places to advertise
- Build more effective ads
- Make your advertising budget go further
- Increase sales conversions and build your business

Objectives of Advertising Research

- **To Enhance Awareness** – Through research, it is easy to plan the marketing strategy of any product/service.
- **To Know Attitudinal Pattern** – A thorough research predicts the people's attitude. It analyses the changing attitudinal pattern of a geographic area. Knowing the consumers' attitude is very important before launching a new product and its advertisement.
- **To Know People's Action/Re-action** – Research also records and analyzes people's action or re-action regarding a particular product/service.
- **Analysis** – Based on deep research and analysis, it is simple to design and develop a creative ad, effective enough to influence consumers.

Essentials of Advertising Research
Following are the essentials of advertising research that support researcher to complete the research task successfully –

- **Research Equipment** – It is the basic requirement of advertising research. It includes a skilled person, computer system with internet, and relevant newspapers and magazine. However, field research is also important. For example, interviewing people in the market or their residential places.
- **Media Research** – To determine, which media is the most effective advertisement vehicle, media research is necessary. It helps to reach the potential customers in a short period of time and at lower cost.
- **Marketing Trends** – Knowledge of marketing trends help advertisers to know what products people are buying and what are the specific features of the products, which compels people to buy. With this information, manufacturers can modify their product according to the trend on competitive price.

- **Target Audience** – For any advertising research, it is very important to identify target audience and geographic location.

Benefits of Advertising Research

Conducting research before launching a new product and subsequently developing an ad has the following advantages –

- **Develops creative design and strategy** – Once, all information is available, it is very simple to develop an eye-catching design. It also helps in making a well-defined strategy to develop your business.
- **Identifies Opportunity in the Market** – Research suggests — what is the right time to launch the product. It also tells, which geographical location is the best for the product.
- **Measures Your Reputation** – It is always beneficial to know your competitor's reputation and credit in the market. It helps to develop faultless strategy.
- **Identifies Major Problems** – Research helps to identify the potential problems.
- **Analyzes Progress** – It helps to analyze the performance of your product. Likewise, you can monitor your progress.
- **Minimize the Risk** – If you have done a thorough market research, there is least chance of failure.

Various Issue involved and ethics in marketing research

In marketing research, there are many potential areas of ethical concern. Each day people share personal information on social media, through company databases, and on mobile devices. So how do companies make sure to remain ethical in decisions when it comes to this vast amount of research data? It is essential that marketers balance the benefits of having access to this data with the privacy of and concern for all people they can impact.

Too many times, we have heard about the lack of ethical decision-making when it comes to marketing research or personal data. Companies are hacked, share or sell personal information, or use promotion disguised as research. Each of these can be considered unethical.

Customers want to do business with companies that are honest, responsible, transparent and sustainable -- both socially and environmentally.

Because of this, ethical issues in marketing have taken center stage. For example, the Balenciaga scandal made headlines in November 2022 as many said it exploited children and caused a social uproar. Today, consumers want ethical marketing that shows businesses are socially responsible and promote that in their marketing materials.

Ethical concerns and standards are part of a company's social responsibility, highlighted in a company's environmental, social and governance plan. Seventy-three percent of U.S. customers want to do business with ethical companies that support social justice, according to a report from Forrester.

Here are some marketing issues to avoid, helping you gain trust and a relationship with potential and current customers.

1. False advertising

False advertising happens when a company overstates or embellishes the benefits of its products and services. Overpromising can be harmful to gaining customers' trust.

Knowing your target audience helps narrow your message. Your products and services are a solution to someone's problem. If you market to the masses instead of targeting your message, you can create false promises.

Your product must match your message. Don't make any claims even if you think customers will understand it's a joke. False advertising can lead to negative brand perceptions if customers feel deceived or disappointed.

One example of false advertising is when 5-hour Energy alleged its energy drink was more effective than coffee and recommended by doctors. The company paid $4.3 million in penalties and fines.

2. Portraying hurtful stereotypes

When creating a message, consider if you are targeting a specific market or a stereotype. Examples of stereotypes include gender roles, race and age. Market research can help remove bias and assumptions and give specific demographics for a target market.

Avoid all campaigns that cross the line of target market demographics. The target market should be backed

by research and not stereotypes. Market research challenges stereotypical judgments by talking to customers and studying the competition to speak appropriately to customers.
Using gender, race and age are sensitive topics, and without the right research, customers may call you out and let you know.

3. Misusing customer data

You might not even know that you are misusing your customer data. Third-party vendors may also be using this data without your knowledge, but customers will fault your business whether you are aware of the issue or not.
Make sure the data you collect is safe from third parties. You may want to consult with a privacy expert to ensure your customer data is safe and not sold to other parties without your knowledge.
Customer privacy is a big concern as people are skeptical of how companies use their personal information and track their behavior. However, companies use this information to understand their target market and help produce the products they want.
Transparency in marketing is critical to avoid crossing the privacy line. Most customers know that companies get information from them, but companies need to share what information they collect and how. Make sure you have your privacy policy visible on your website, such as in the footer. Some companies also include messaging about cookies and how they are used. Others add pop-ups where visitors consent to using cookies before browsing.
TikTok has made the news with its data practices as it acknowledged that non-U.S. employees had access to U.S. users' data. States have started banning government employees from using TikTok to share information for this reason.

4. Negative advertising

Competition is a part of business, but you should never advertise the negatives of other companies to try to win their business. This type of negative advertising -- or smear tactic -- can be unethical.
Discrediting a competitor to gain new customers may do the opposite. Customers may lose respect for your company. You could also face a legal fallout with the other company if you name its brand in these advertisements.
Be sure to have clear standards for your promotions, and stick to highlighting your product or service benefits.

5. Advertising misleading pricing

There are some marketing issues involving price hikes and predatory promotions. When businesses artificially inflate prices either during a high-demand time or sales promotion, this is known as *price hiking*.
Predatory promotion is the practice of promoting extremely low prices to attract customers, stealing them away from competition. These advertised prices are typically so low that the competition can't beat the price, so customers leave for a better deal. After the customer signs on, the business returns to its normal pricing.
This bait-and-switch technique sometimes goes even further by advertising a lower price to get a customer's attention. The company then says the advertised products are unavailable and push the customer to more expensive choices.
Pricing is an important part of marketing, and being transparent about costs helps build trust with customers. Share your fixed prices, and show how your prices align with your products and services.

Rural Marketing Research

The systematic design , collection, analysis and reporting of data and findings relevant to a specific marketing situation facing by the company in rural market.

"The systematic planning, gathering, recording and analyzing data about problems related to marketing of goods and services." **-American Marketing Association.**

Rural Marketing Research is a specialized area of study that focuses on understanding the preferences, behaviors, and needs of consumers in rural areas. This research is crucial for developing strategies that effectively address the unique challenges and opportunities present in rural markets. Unlike urban markets, rural areas have distinct characteristics such as lower population density, limited infrastructure, diverse cultural norms, and seasonal income variations due to agricultural dependence. Rural marketing research

involves collecting and analyzing data on these aspects to tailor products, pricing, distribution, and promotional efforts that resonate with rural consumers. It employs various methodologies, including surveys, focus groups, and observational studies, often adapting techniques to overcome challenges like literacy levels and access issues. This research provides invaluable insights that help businesses innovate and create value-added solutions, ensuring their offerings are accessible, affordable, and acceptable to the rural populace, thereby unlocking the vast potential of these markets.

Rural Market Research process
Step-I Defining a research problem
Step-II Finalizing a research design
Step-III Developing a research hypothesis
Step-IV Planning the research methodology
Step-V Data collection
Step-V Data analysis
Step-VI Conclusion and Recommendations

Types of Rural Marketing Research
Quantitative studies
Since penetration and consumption of most products are low, the market is under development, hence quantitative studies cannot be done for most products
Qualitative studies
4As of Rural marketing – Acceptability, Affordability, Awareness and Availability
U &A (Usage & Attitudes) or KAP (Knowledge, Attitude and Practices)
Feasibility
Mapping distribution, promotion and communication channels

Do's and Don'ts in rural market research
- Wears simple clothes
- Familiar with local language or accompany a known person
- Spent time with villagers even though it is not needed to his research
- Purpose and its benefits to villagers should be explained in order to get correct data's.
- Issues sensitive to respondents should be carefully handled
- Male researchers should approach a woman through her husband or guardian of the woman.
- Avoid one- to-one interact as they gather as crowd.
- Researcher always carry food, water and first aid kit to avoid health problems

Limitations and challenges in rural market research
- Nature of Rural Market
- Scarcity of Rural Marketing Research Budget
- Lack of Uniformity in Secondary Data
- Accessibility
- Lack of Facilities in Rural Areas
- Comprehension of Research Tools
- Sensitivity of Rural People

Institutional Management & Research
Institutional management is compulsory for every educational institution. For ensuring grand success of any educational programme management is a must which depends on institutional management. Institutional management means management of different programmes and activities. This tends to the realization of the prime goals of every educational institution. In order to realize the prime goals of every educational programme of an institution there is the need of co-ordination in management.

It is the process of putting things together in a harmonious manner and relationship do that they may

function more effectively in the management of an educational programme. The Administrator in charge of the administration is to be ready with many physical, social and economic aspects which should be exercised and administered by him for smooth management of the programme.

Components of Institutional Management:
The components of institutional management are of two types:
(i) Organisation and management of curricular activities and
(ii) organisation and management of co-curricular activities.
In the total programme of education, curricular and co-curricular activities occupy the central position. Curricular and co-curricular activities are complementary to each other. These activities help in developing integrated human personality. There was a time when the whole purpose of the educational institution was conceived to be confined to the teaching of prescribed syllabus. Other activities were regarded as additional. Participation in social and sports activities or outside the classroom activities was looked down upon as a mere side show. It was thought that these activities had no link with the actual teaching programme. Here a detail discussion on co-curricular activities has been done along with curricular activities.

"What is Institutional Research?" (or IR as it is more affectionately known), are as diverse as each college and university. The roles and responsibilities of Institutional Research differ for every institution, depending on the needs of the institution.
Broadly, institutional research is "research conducted within an institution of higher education to provide information which supports institutional planning, policy formation and decision making". Research activities include the collection, analysis and interpretation of institutional data to promote institutional effectiveness in all areas of the institution.
Institutional research is like the detective work of the academic world. It involves collecting, analyzing, and interpreting data to help educational institutions make informed decisions. Think of it as the behind-the-scenes investigator that helps schools and organizations understand themselves better.
It is one kind of tool that empowers educational institutions to understand their strengths, address their weaknesses, and continually strive for improvement. It's like having a trustworthy compass, ensuring institutions are on the right path to success.

The Effectiveness of Institutional Research

- **Inform Decision-Making** IR's effectiveness is at the core of its ability to provide data on various institutions. This data isn't just numbers on a spreadsheet; it's the key to data-informed decision-making. From enrollment trends to faculty performance, IR equips institutions with the knowledge they need to make strategic decisions that benefit everyone involved.
- **Continuous Improvement** Imagine a school or college as a living, breathing entity. Just like any living thing, it needs to grow and improve. IR acts as the gardener, nurturing the institution to bloom into its full potential. IR identifies areas that need attention by analyzing data on student outcomes, program effectiveness, and more. It creates a culture of continuous improvement.
- **Student Success** At the heart of every educational institution are the students. IR plays a vital role in ensuring their success. By tracking student performance, attendance, and engagement, IR helps institutions tailor their support systems. This not only boosts student success but also enhances the overall learning experience.
  How to Utilize QuestionPro to Conduct Institutional Research?
  Conducting institutional research involves gathering valuable insights to enhance educational strategies and decision-making. QuestionPro, a powerful survey and research platform, can significantly streamline and enhance the process. Here's a guide on how to effectively utilize QuestionPro for your academic research:
- **Single Platform for Research** QuestionPro offers a comprehensive platform that supports various types of research, including classroom research, experimental design, and academic research. It provides insights and analytics tools to facilitate the entire research process.
- **Simple to Sophisticated Research** The platform is created for a wide range of users, including students, researchers, and faculty. Whether you're conducting a simple survey or a sophisticated research project, QuestionPro aims to provide the necessary tools and features.

- **Collaborative Research Across Universities** QuestionPro supports collaborative efforts by allowing multiple users to work on the same survey. This feature encourages teamwork and facilitates joint research projects involving individuals from different universities.
- **Quantitative and Qualitative Reporting** The platform offers both quantitative and qualitative reporting options. This means you can analyze numerical data as well as gather insights from open-ended responses, providing a well-rounded view of your research findings.
- **Data Analytics and Offline Surveys** QuestionPro enables the collection of data offline. It allows an institutional researcher to gather information in various settings. The platform then uses advanced AI for data analytics, enhancing the depth and power of research insights.
- **Advanced Logic and Workflows** QuestionPro provides advanced logic and workflows in survey design. This allows for the creation of smarter surveys, ensuring that questions and responses are presented logically and meaningfully.

UNIT 3
RRSEARCH DESIGN

Research Process

The research process consists of a series of systematic procedures that a researcher must go through in order to generate knowledge that will be considered valuable by the project and focus on the relevant topic.

To conduct effective research, you must understand the research process steps and follow them. Here are a few steps in the research process to make it easier for you:

Step 1: Identify the Problem

Finding an issue or formulating a research question is the first step. A well-defined research problem will guide the researcher through all stages of the research process, from setting objectives to choosing a technique. There are a number of approaches to get insight into a topic and gain a better understanding of it. Such as:

- A preliminary survey
- Case studies
- Interviews with a small group of people
- Observational survey

Step 2: Evaluate the Literature

A thorough examination of the relevant studies is essential to the research process. It enables the researcher to identify the precise aspects of the problem. Once a problem has been found, the investigator or researcher needs to find out more about it.

This stage gives problem-zone background. It teaches the investigator about previous research, how they were conducted, and its conclusions. The researcher can build consistency between his work and others through a literature review. Such a review exposes the researcher to a more significant body of knowledge and helps him follow the research process efficiently.

Step 3: Create Hypotheses

Formulating an original hypothesis is the next logical step after narrowing down the research topic and defining it. A belief solves logical relationships between variables. In order to establish a hypothesis, a researcher must have a certain amount of expertise in the field.

It is important for researchers to keep in mind while formulating a hypothesis that it must be based on the research topic. Researchers are able to concentrate their efforts and stay committed to their objectives when they develop theories to guide their work.

Step 4: The Research Design

Research design is the plan for achieving objectives and answering research questions. It outlines how to get the relevant information. Its goal is to design research to test hypotheses, address the research questions, and provide decision-making insights.

The research design aims to minimize the time, money, and effort required to acquire meaningful evidence. This plan fits into four categories:

- Exploration and Surveys
- Experiment
- Data Analysis
- Observation

Step 5: Describe Population

Research projects usually look at a specific group of people, facilities, or how technology is used in the business. In research, the term population refers to this study group. The research topic and purpose help determine the study group.

Suppose a researcher wishes to investigate a certain group of people in the community. In that case, the research could target a specific age group, males or females, a geographic location, or an ethnic group. A final step in a study's design is to specify its sample or population so that the results may be generalized.

Step 6: Data Collection

Data collection is important in obtaining the knowledge or information required to answer the research issue. Every research collected data, either from the literature or the people being studied. Data must be collected from the two categories of researchers. These sources may provide primary data.

- Experiment
- Questionnaire
- Observation
- Interview

Secondary data categories are:

- Literature survey
- Official, unofficial reports
- An approach based on library resources

Step 7: Data Analysis

During research design, the researcher plans data analysis. After collecting data, the researcher analyzes it. The data is examined based on the approach in this step. The research findings are reviewed and reported.

Data analysis involves a number of closely related stages, such as setting up categories, applying these categories to raw data through coding and tabulation, and then drawing statistical conclusions. The researcher can examine the acquired data using a variety of statistical methods.

Step 8: The Report-writing

After completing these steps, the researcher must prepare a report detailing his findings. The report must be carefully composed with the following in mind:

The Layout: On the first page, the title, date, acknowledgments, and preface should be on the report. A table of contents should be followed by a list of tables, graphs, and charts if any.

Introduction: It should state the research's purpose and methods. This section should include the study's scope and limits.

Summary of Findings: A non-technical summary of findings and recommendations will follow the introduction. The findings should be summarized if they're lengthy.

Principal Report: The main body of the report should make sense and be broken up into sections that are easy to understand.

Conclusion: The researcher should restate his findings at the end of the main text. It's the final result.

Identification & formulation of Research Problem

The main steps in identification & formulation of research problem are:

1. Specify the Research Objectives

A clear statement of objectives will help you develop **effective research.**
It will help the decision makers evaluate your project. **It's critical** that you have manageable objectives. (Two or three clear goals will help to keep your research project focused and relevant.)

2. Review the Environment or Context of the Research Problem

As a marketing researcher, you must work closely with your team. This will help you determine whether the findings of your project will produce enough information to be worth the cost.
In order to do this, you have to identify the environmental variables that will affect the research project.

3. Explore the Nature of the Problem

Research problems range from simple to complex, depending on the number of variables and the nature of their relationship.
If you understand the nature of the **problem as a researcher**, you will be able to better develop a solution for the problem.
To help you understand all dimensions, you might want to consider focus groups of consumers, sales people, managers, or professionals to provide what is sometimes much needed insight.

4. Define the Variable Relationships

Marketing plans often focus on creating a sequence of behaviors that occur over time, as in the adoption of a new package design, or the introduction of a new product.
Such programs create a commitment to follow some behavioral pattern in the future.
Studying such a process involves:

- Determining which variables affect the solution to the problem.
- Determining the degree to which each variable can be controlled.
- Determining the functional relationships between the variables and which variables are critical to the solution of the problem.

During the **problem formulation** stage, you will want to generate and consider as many courses of action and variable relationships as possible.

5. The Consequences of Alternative Courses of Action

There are always consequences to any course of action. Anticipating and communicating the possible outcomes of various courses of action is a primary responsibility in the research process.

Variables & Types of Variables

When it comes to experiments and data analysis, there are two main types of variables: **dependent variables** and **independent variables**. It's easy to get these mixed up, but the difference between dependent and independent variables is simple. Here is a quick and easy definition of each one, along with some examples.

1) Dependent Variable: This is the output variable you are really interested in monitoring to see if it was affected or not. It can also be called the "measured variable," the "responding variable," the "explained variable," etc. I think it is easy to remember this one because it is dependent on the other variables.

2) Independent Variables: These are the individual variables that you believe may have an effect on the dependent variable. They are sometimes called "explanatory variables," "manipulated variables," or "controlled variables."

Example #1: Golf Balls

Here's a simple situation: Suppose you want to test golf ball flight distances, so you set up a simple experiment in which various golf balls are placed into a mechanical chute and fired into the air. The variable you really care about, the "output" or **dependent variable** is golf ball distance. **Independent variables** are the variables you are going to test to see how they affect distance. In this case, they are going to be things like air temperature, golf ball brand, and color of the golf ball. In the end, if you do a fancy regression analysis on all your data, you are going to end up with a formula that looks something like this: golf ball distance = 50 feet + air temperature factor + golf ball brand factor + golf ball color factor. See how all the independent variables (air temp, brand, color) have an effect on the dependent variable (distance)?

Example #2: Ice Cubes

Here's another simple example: Imagine that you have a bunch of ice cubes and you want to test how long it takes them to melt in various situations. You have an experiment with 1,000 equally shaped ice cubes. Some of them are made of frozen cranberry juice and some of them are frozen lemonade. You are going to set some of them on a metal sheet and others are going to be placed on a wooden plank. Air temperature, wind, and every other condition you can think of will remain constant. So, in this case, your **dependent variable** is ice cube melting time. Your two **independent variables** are: juice type (cranberry or lemonade) and melting surface (metal or wood). I'm not sure why anyone would care to do such an experiment, but hopefully the difference between the dependent and independent variables are clear now.

Research Design

A **research design** is a strategy for answering your research question using empirical data. Creating a research design means making decisions about:

- Your overall research objectives and approach
- Whether you'll rely on primary research or secondary research
- Your sampling methods or criteria for selecting subjects
- Your data collection methods
- The procedures you'll follow to collect data
- Your data analysis methods

A well-planned research design helps ensure that your methods match your research objectives and that you use the right kind of analysis for your data.

Types of Research Designs

1.Exploratory Research-

Used to investigate a research problem which is not clearly defined.It is conducted to have a better understanding of the existing problem but will not provide conclusive results. The researcher starts with a general idea and uses this research as a medium to identify issues.

It answers what why and how type of questions. Exploratory Research design is unstructured and therefore very flexible in nature.

For ex -if a canteen decides to go introduce vegan items but does not have any idea of its feasibility and likability among consumers.

Types of exploratory research-

i) Literature survey (Referring to literature to develop a new hypothesis, literature referred are journals, books, statistical publications market research findings etc.)

Ex- Why are sales down?

This can quickly be analyzed with published data that it an industry problem or firm problem.

There can be 3 situations-

- The company market share has declined but industry market share is also declining
- The industry is declining so company's market share is also declining
- Industry market share is going up but company market share is declining.

ii) Focus- Group Discussions- A focus group is a highly versatile and dynamic method of collecting information from a representative group of respondents. The process generally involves a moderator who maneuvers the discussion on the topic under study. There are a group of carefully selected respondents who are specifically invited and gathered at a neutral setting. The moderator initiates the discussion and then the group carries it forward by holding a focused and an interactive discussion. The technique is extensively used and at the same time also criticized. While one school of thought places group dynamics at an important position, another negates its contribution as detrimental.

The recommended size of group is 8-12 people.

iii) In-depth interviews:

Direct questions to consumers about their attitudes & motives seldom elicit useful answers. Most people do not have clear ideas why they make particular purchase decisions. Direct questions do not measure the relative importance of the various types of reasons, and many individuals will not report motives that might be considered base Or socially unacceptable. The family that bought new Jaguar to feel superior to their neighbors would be unlikely to report such motivation they understood the motivation themselves. Instead of approaching respondents with fixed list of questions, the interviewer, in depth interviews, attempts to influence respondents to

talk freely about the subject of interest. This is intended to put respondents at ease so they will express any ideas they have on the subject. If some idea of interest is passed over too quickly, the interview my seek additional information by "probing". For example, the interviewer may comment "That's interesting. Why do you feel that way?" This encourages further discussion of the point. Various probes can be used as desired to get respondents to expand on particular ideas.

Although no formal questionnaire is used in depth interviews, the interviewer has an outline in mind. If the respondents do not get into areas of special interest, the interviewer will insert questions to open up these topics. The objective is to get below the respondents' surface reasons for particular marketing decisions to find the underlying factors. This is the source of the name "depth interviewing".

The advantages of depth interviews are obvious from the above discussion- they bring out information that would not be obtained in a normal interview. The interviewer has a great deal of flexibility and can use his ingenuity to stimulate respondents to reveal some more of their attitudes and motives. This flexibility on the part of the interviewer, however, is also a major disadvantage. No two interviewers will proceed in exactly the same way, thus it is difficult to compare results.

This reliance on skill of the interviewer also creates other problems. Only individuals with special training and skill can be used successfully as interviewers- and they are expensive. Any biases on the part of the interviewer may be reflected in the results. Depth interviews take longer than other interviews, this creates difficulty in securing respondent cooperation and increases costs. A further disadvantage of the depth interview is the difficulty and cost of interpretation. Interpretations are obviously subjective and may vary from one analyst to another. Depth interviews were popular in the 1950s but were then superseded by focus groups. They are now making a comeback.

iv) Expert opinion survey (Experience survey)- may be company executives ,or persons outside the organizations, no questionnaire is required. they will share their expertise. For example, in order to deal with a consumer product problem, a marketing executive would be sufficient to provide required information as he is having experience in the field of consumer marketing. Experience surveys are very helpful in getting vital information about any topic. This information is very reliable. This method is only used when secondary data is difficult to obtain.

v) Projective Techniques: Instead of asking direct questions, the method involves a relatively ambiguous stimuli and indirect questions related to imaginary situations or people. The purpose of the research is to present a situation to the respondents to project their underlying needs, emotions beliefs and attitudes on to this. The ambiguity of the situation is non-threatening and thus the person has no hesitation in revealing his true inner motivations and emotions. The more

the degree of ambiguity, the more is the range of responses one gets from the respondents. In the theoretical sense, projective techniques unearth beliefs, attitudes and feelings that might underlie certain behaviour or interaction situations. Thus, the respondents attitudes are uncovered by analysing their responses to the scenarios that are deliberately constructed to stimulate responses from the right side of the brain which is stated to be the affective side. The second premise of projective techniques is to uncover the different levels of consciousness (Freud, 1911). Generally, the structured methods look at primary motivations; however, it is the underlying latent needs which might drive the individual to behave in a certain manner. The third is to reveal data that is inhibited by socially-desirable and correct responses. Sometimes individuals hesitate to express their prejudices or feelings towards other individuals groups or objects. Indirect and ambiguous stimuli might reveal startling results in such cases. In psychology there are a wide variety of techniques available. These can be categorized on the basis of the conduction process. Some of these techniques are briefly discussed below.

vi)Observation:

Observation The method involving the systematic recording and assessment of behavioral forms of a particular individual (or group of individual), object or event so as to collect desired information about a research problem without any personal communication is called 'Observation'. Here, the observer observes the object from a suitable distance or through audio video recordings. The information is recorded for future use. The respondents may be observed in their natural environment or a contrived environment is designed for the purpose. The approach for observation may be direct or indirect, structured or unstructured. The observation method is very popular for behavioral science researches. Every individual observes certain things around him/her but it cannot be termed as scientific observation. Scientific observation is the observation where a particular research problem is the focus of the observation. A systematic planning and controlling is required for recording such observations. Different validity and reliability check measures are used here so as to collect accurate information. Methods of Observation The different methods used for observing respondents or objects are as follows :

1) Structured and Unstructured Observation : When the research area or objects are clearly described to the observer, it is called 'structured observation'. On the other hand, the observer is free to observe whatever he/she thinks important. in 'unstructured observation'.

2) Direct and Indirect Observation : 'Direct observation' refers to the observation of the respondent's behavior directly by the observer. On the other hand, in 'indirect observation, the previously recorded behavior is observed by the observer so as to finds any relevant pattern for the current research topic.

3) Natural and Contrived Observation : When the observer prefers to observe the object in

his/her natural or realistic environment, it is called "natural observation'. It is affected by certain extraneous variables. In order to eliminate such variables, observer prefers to observe the object in laboratory setting. It is called 'contrived observation'. In contrived observation different economic measurements aroused for effective collection of information.

4) Disguised Observation : When the objects or informants are not informed about the observation process, it is called 'disguised observation'. It is preferred because generally respondents modify their behavior when they are informed. Although it is not easy to perform such observation due to ethical norms (it is ethically wrong to observe behavior of people without describing them the purpose).

5) Human-Mechanical Observation : When a person is assigned to observe the behavior of a respondent, it is called human observation'. Whereas observation done by a machine or instrument (like audiometers, eye cameras, etc.) is called mechanical observation'. Generally, human observations are preferred as it uses trained observers who are reliable, Mechanical observations do not have this much reliability and validity.

Characteristics of Exploratory Research-

- It Provides the ground work for further research.
- It is used to investigate the issues that are not fully defined.
- It is the very first form of research in the research process and therefore takes place before descriptive research.
- It is unstructured in nature.
- It generally involves use of the qualitative research.

2.Descriptive Research

It is often used to obtain information concerning the current status of the phenomenon to describe " what exists" means the relationship between the variables.

It is concerned with gaining a deeper understanding of what the phenomenon is rather than why or how it takes place.it, Therefore, describes the subject of research without addressing why it happens.it is conclusive in nature.

A descriptive study attempts to describe the characteristics of social phenomena. For example, a descriptive study may focus on the people of a particular community and describe the state of their physical and mental health, the education level, the social status, the economic status, etc. The study may also report about the attitude of the people of the community towards different subjects; the behavior pattern of the community in different situations. Hence, a descriptive study may be defined as a study which seeks to describe the characteristic features of people, their attitudes and behaviour patterns.

The researcher undertaking a descriptive study should have sufficient prior knowledge about the field of study; he should clearly specify and define the variables to be studied. The manner and method of measuring the variables have also to be determined prior to the study. Appropriate techniques have to be employed to generate valid and reliable measurements of variables. The findings and inferences regarding the characteristics of community are usually generalized from the study of a sample of people selected from the community. Who is to be included in the sample and how the sample should be selected are important questions to be answered by the researcher before the execution of the study. The data required for the study may be collected from the sample by different methods such as record verification, observation, questionnaire, interview, etc. As the purpose of the descriptive study is presentation of complete and accurate information about the subject of study, it becomes necessary to minimize bias and ensure reliability in data collection, analysis and interpretation.

The procedures to be followed in a descriptive study must be planned in advance and included in the research design. The design should be structured and specific regarding details; it should also focus on minimizing the bias and maximizing the reliability of the data collected for the study.

Types of Descriptive Research-

i) Case Studies- Detailed analysis of people or events. This is done by researcher and may be biased due to his or her subjectivity and interpretations. Case studies provide compelling evidence for a theory. case study also illustrate how a theory can be applied to persons or events.

ii) Observational Research- Natural behavior of individuals or groups in certain setting is required.It must be unobtrusive otherwise there may be subject reactivity.this often reduces with time (habituation)

Observers can not observe behavior of all time they may use a checklist and may also use time sampling or event sampling procedures.

iii) Survey Research – Structured questions to assess people's beliefs, attitudes ,behaviour.usuallly done through a representative sample.People may display social desirability while answering (false responses), Interview, face to face , phone surevey, email survey are examples.

Characteristics of Descriptive Research :

- Variables are not controlled in this research.
- Generally takes form of a cross sectional study where multiple sections belonging to the same group are being investigated.
- It provides a base for further research.

3.Action Research- It is a strategy that tries to find realistic solutions to organizations difficulties and issues.It is basically learning by doing. First a problem is identified then some actions are taken to address it then how well the efforts worked are measured.

i) Classical action Research(Positivist) -This type of research is a social experiment. Used to test

theories in actual world.

ii) Contemporary Action Research (Interpretive)This kind of research thinks that business reality is socially made and when doing this research it focuses on the details of local and organizational factors.

iv) Critical) This type of action research that takes a critical approach to co operate systems and tries to enhances them

4.Experimental Research-

Attempting to prove hypothesis by way of experimentation. It is done in controlled environment. Goal of study is to examine cause and effect relationships. may be in laboratory or field settings.it has limited generalizability.

1. Experimental or Causal Research

It is a type of conclusive research which attempts to establish a cause-and-effect relationship between two or more variables.

In this research the researcher purposely manipulates the level or nature of one or more independent variable/s in order to see its effect on dependent variables.

The basic hypothesis in a causal relationship is that one variable, X, causally influences another variable, Y. In this case, X is the independent variable influencing the dependent variable Y. Whether there is a cause and effect relationship between the independent variable and the dependent variable can be evaluated by setting up an experimental study.

The basic structure of the experiment is simple. Two groups of people would be selected for the study; one would be called the 'experimental group' and the other would be called the'control group'. The experimental group is the group that is exposed to the causal (independent) variable; the control group is a group of people who are not exposed to the causal variable. The two groups are then compared in terms of the assumed effect (the dependent variable) to evaluate impact of the causal variable.

The selection of the experimental group and the control group is a critical factor influencing the success of the experimental study. The basic assumption in the selection of the two groups is that the two groups are equivalent groups in all respects except for the exposure to the independent variable. The selection process should ensure that this basic assumption is indeed true. The outcome of the selection process should be two such equivalent groups, this is essential to exclude the possibility that any different in terms of the dependent variable is due to initial differences between the two groups.

Let us consider an example. A training programme is being planned for the employees of an organization. An evaluation of the impact of the training programme on the knowledge and skill of employees can be assessed with the help of an experimental study. Two groups of employees will have to be selected for the experiment. The experimental group consists of employees who will undergo the training programme, while the control group would consist of employees who will not undergo the training programme. The two groups have to be matched in terms of age, gender, experience, educational qualification, etc. The employees matched In terms of each characteristic have to be randomly assigned to the two groups.

Utility of this research design is when a researcher wants to –

- Find out which variables are the cause and which are effect.
- Ascertain the nature and degree of the relationship between the said variables.
- Predict about the dependent variable with respect to associated independent variable.

Types of Experimental Research –

- After only design
- Before after design
- After only with control
- Before-after with control.
- Ex-post-Facto design
- Completely Randomized Design

After only design- Simplest form of experimental design. As the after name suggests, this design consists of applying the experimental variable (e.g. advertising) to an experimental group(e.g. consumers) and measuring the dependent variable (e.g. recall of brand name)

Before -after Design-

In this design the experimenters measure the dependent variable before exposing the subjects to the experimental variable and again after exposure to experimental variable.The difference between the two is considered to be a measurement of effect of the experimental variable.

Before measurement = yes (X1)

Experimental variable introduced = yes

After Measurement + yes(X2)

Effect of experimental variable =X2-X1

Before – after with control group.

	Experimental Group.	Control Group
Before Measurement	yes (X1)	Yes (Y1)
Experimental variable	yes	No
After measurement	yes (X2).	Yes (Y2)

Effect of experimental Variable = (X2-X1) – (Y2-Y1)

X1= 19.4

Y1=19.4

Exp.Variable applied =yes

X2= 20.5

Y2=16.9

(20.5-19.4) – (16.9-19.4)

(1.1) - (-2.5) =3.6%

After only with control group-

	Experimental Group.	Control Group
Before Measurement	No	No
Experimental variable	yes	No
After measurement	yes (X1).	Yes (Y1)

Effect on independent variable= X1-Y1

Need and Importance of Research Design

Research design carries an important influence on the reliability of the results attained. It therefore provides a solid base for the whole research. It is needed due to the fact that it allows for the smooth working of the many research operations. This makes the research as effective as possible by providing maximum information with minimum spending of effort, money and time. For building of a car, we must have a suitable blueprint made by an expert designer. In a similar fashion, we require a suitable design or plan just before data collection and analysis of the research project. Planning of design must be carried out cautiously as even a small mistake might mess up the purpose of the entire project. The design helps the investigator to organize his ideas, which helps to recognize and fix his faults, if any. In a **good research design**, all the components go together with each other in a coherent way. The theoretical and conceptual framework must with the research goals and purposes. In the same way, the data gathering method must fit with the research purposes, conceptual and theoretical framework and method of data analysis.

A research design is like a successful journey:

- Broadens your mind

- Provides fascinating & exciting experience
- Gives understanding of world around you
- Provides chance to meet people
- Gives fun and reward, but sometimes, very tedious & monotonous too.

The importance of research design in research methodology is due to the following:

- It may result in the preferred kind of study with helpful conclusion.
- It cuts down on inaccuracy.
- Allows you get optimum efficiency and reliability.
- Reduce wastage of time.
- Reduce uncertainty, confusion and practical haphazard related to any research problem.
- Of great help for collection of research material and testing of hypothesis.
- It is a guide for giving research the right path.
- Gets rid of bias and marginal errors.
- Provides an idea concerning the type of resources needed in terms of money, effort, time, and manpower.
- Smooth & efficient sailing (sets boundaries & helps prevent blind search)
- Maximizes reliability of results.
- Provides firm foundation to the endeavor.
- Averts misleading conclusions & thoughtless useless exercise.
- Provides opportunity to anticipate flaws & inadequacies (anticipates problems).
- Incorporates by learning from other people's critical comments & evaluations.

Features of a good Research Design

Research in simplified terms means searching for the facts searching for the replies to the various queries and also for the solutions to the various problems. Research is an inquiry or an investigation with a specific purpose to fulfill, it helps in clearing the various doubtful concepts and tries to solve or explain the various unexplained procedures or phenomenons.

The features that a good research procedure must possess are –

1. Should be systematic in nature.
2. Should be logical.
3. Should be empirical and replicable in nature.
4. Should be according to plans.
5. Should be according to the rules and the assumptions should not be based on the false bases or judgments.
6. Should be relevant to what is required.
7. Procedure should be reproducible in nature.
8. Controlled movement of the research procedure.

Different Research Designs

1) **Pure research**

a. Also called as the fundamental or the theoretical research.
b. Is basic and original.
c. Can lead to the discovery of a new theory.
d. Can result in the development or refinement of a theory that already exists.
e. Helps in getting knowledge without thinking formally of implementing it in practice based on the honesty, love and integrity of the researcher for discovering the truth.

2) **Applied research**

a. Based on the concept of the pure research.
b. Is problem oriented.
c. Helps in finding results or solutions for real life problems.
d. Provides evidence of usefulness to society.
e. Helps in testing empirical content of a theory.
f. Utilizes and helps in developing the techniques that can be used for basic research.
g. Helps in testing the validity of a theory but under some conditions.
h. Provides data that can lead to the acceleration of the process of generalization.

3) **Exploratory research**

a. Involves exploring a general aspect.
b. Includes studying of a problem, about which nothing or a very little is known.
c. Follows a very formal approach of research.
d. Helps in exploring new ideas.
e. Helps in gathering information to study a specific problem very minutely.
f. Helps in knowing the feasibility in attempting a study.

4) **Descriptive research**

a. Simplest form of research.
b. More specific in nature and working than exploratory research.
c. It involves a mutual effort.
d. Helps in identifying various features of a problem.
e. Restricted to the problems that are describable and not arguable and the problems in which valid

standards can be developed for standards.
f. Existing theories can be easily put under test by empirical observations.
g. Underlines factors that may lead to experimental research.
h. It consumes a lot of time.
i. It is not directed by hypothesis.

5) **Diagnostic study**

a. Quite similar to the descriptive research.
b. Identifies the causes of the problems and then solutions for these problems.
c. Related to causal relations.
d. It is directed by hypothesis.
e. Can be done only where knowledge is advanced.

6) **Evaluation study**

a. Form of applied research.
b. Studies the development project.
c. Gives access to social or economical programmes.
d. Studies the quality and also the quantity of an activity.

7) **Action research**

a. Type of evaluation study.
b. Is a concurrent evaluation study.

Decision Tree Analysis

Decision tree analysis is the process of drawing a decision tree, which is a graphic representation of various alternative solutions that are available to solve a given problem, in order to determine the most effective courses of action. Decision trees are comprised of nodes and branches - nodes represent a test on an attribute and branches represent potential alternative outcomes.

What is Decision Tree Analysis?

A decision tree is a tree-like model that acts as a decision support tool, visually displaying decisions and their potential outcomes, consequences, and costs. From there, the "branches" can easily be evaluated and compared in order to select the best courses of action.

Decision tree analysis is helpful for solving problems, revealing potential opportunities, and making complex decisions regarding cost management, operations management, organization strategies, project selection, and production methods.

Drawing a decision tree diagram starts from left to right and consists of "burst" nodes that split into different paths. Nodes are categorized as Root nodes, which compiles the whole sample and is then split into multiple sets; Decision nodes, typically represented by squares, are sub-nodes that diverge into further possibilities; and the Terminal node, typically represented by triangles, is the final node that shows the final outcome that cannot be further categorized.

Branches, or lines, represent the various available alternatives, and sub-nodes can be eliminated via Pruning. Decision trees can be hand-drawn or created with the use of decision tree software. Analysis can be performed manually, via decision tree analysis in R, or via automated software.

Five Steps of Decision Tree Analysis

The steps in decision tree analysis consist of:

1. Define the problem area for which decision making is necessary.
2. Draw a decision tree with all possible solutions and their consequences.

3. Input relevant variables with their respective probability values.
4. Determine and allocate payoffs for each possible outcome.
5. Calculate the Expected Monetary Value for every chance node in order to determine which solution is expected to provide the most value. Circles represent chance nodes in a tree diagram.

Popular applications include: decision tree analysis in risk management, decision tree analysis in healthcare, decision tree analysis in capital budgeting, decision tree business analysis, and decision tree analysis in finance.

Advantages and Disadvantages of Decision Tree Analysis

There are risks and rewards associated with the process of decision tree analysis. The advantages of decision tree analysis include: simple and easy to interpret decision trees; valuable without requiring large amounts of hard data; helps decision makers ascertain best, worst, and expected results for various scenarios; and can be combined with various decision techniques.

When using decision tree analysis, there may also be some disadvantages. Disadvantages include: uncertain values can lead to complex calculations and uncertain outcomes; decision trees are unstable, and minor data changes can lead to major structure changes; information gain in decision trees can be biased; and decision trees can often be relatively inaccurate. A popular alternative to decision trees is the influence diagram, which is a more compact, mathematical graphical representation of a decision situation.

UNIT 4

MEASUREMENT METHODS

Interview Research

1) The qualitative research interview seeks to describe and the meanings of central themes in the life world of the subjects. The main task in interviewing is to understand the meaning of what the interviewees say.
2) A qualitative research interview seeks to cover both a factual and a meaning level, though it is usually more difficult to interview on a meaning level.
3) Interviews are particularly useful for getting the story behind a participant's experiences. The interviewer can pursue in-depth information around the topic. Interviews may be useful as follow-up to certain respondents to questionnaires, e.g., to further investigate their responses.

Characteristics of Interview

1) Interviews are completed by the interviewer based on what the respondent says.
2) Interviews are a far more personal form of research than questionnaires.
3) In the personal interview, the interviewer works directly with the respondent
4) Unlike with mail surveys, the interviewer has the opportunity toprobe or ask follow up questions.
5) Interviews are generally easier for respondent, especially if what is sought is opinions or impressions.
6) Interviews are time consuming and they are resource intensive.
7) The interviewer is considered a part of the measurement instrument and interviewer has to well trained in how to respond to any contingency

Types of Interviews

1) **Informal, conversational interview** -no predetermined questions are asked, in order to remain as open and adaptable as possible to the interviewee's nature and priorities; during the interview the interviewer "goes with the flow".
2) **General interview guide approach** -the guide approach is intended to ensure that the same general areas of information are collected from each interviewee; this provides more focus than the conversational approach, but still allows a degree of freedom and adaptability in getting the information from the interviewee.
3) **Standardized, open-ended interview** -the same open-ended questions are asked to all interviewees; this approach facilitates faster interviews that can be more easily analyzed and compared.
4) **Closed, fixed-response interview** -where all interviewees are asked the same questions and asked to choose answers from among the same set of alternatives. This format is useful for those not practiced in interviewing

Survey Research & its Types

A survey is defined as a brief interview or discussion with individuals about a specific topic. The term survey is unfortunately a little vague, so we need to define it better. The term survey is often used to mean 'collect information.

Classification of Survey Design According to Instrumentation

In survey research, the instruments that are utilized can be either a questionnaire or an interview (either structured or unstructured).

1. Questionnaires

Typically, a questionnaire is a paper-and-pencil instrument that is administered to the respondents. The usual questions found in questionnaires are closed-ended questions, which are followed by

response options. However, there are questionnaires that ask open-ended questions to explore the answers of the respondents.

Questionnaires have been developed over the years. Today, questionnaires are utilized in various survey methods, according to how they are given. These methods include the self-administered, the group-administered, and the household drop-off. Among the three, the self-administered survey method is often used by researchers nowadays. The self-administered questionnaires are widely known as the mail survey method. However, since the response rates related to mail surveys had gone low, questionnaires are now commonly administered online, as in the form of web surveys.

- **Advantages:** Ideal for asking closed-ended questions; effective for market or consumer research
- **Disadvantages:** Limit the researcher's understanding of the respondent's answers; requires budget for reproduction of survey questionnaires

2. Interviews

Between the two broad types of surveys, interviews are more personal and probing. Questionnaires do not provide the freedom to ask follow-up questions to explore the answers of the respondents, but interviews do.

An interview includes two persons - the researcher as the interviewer, and the respondent as the interviewee. There are several survey methods that utilize interviews. These are the personal or face-to-face interview, the phone interview, and more recently, the online interview.

- **Advantages:** Follow-up questions can be asked; provide better understanding of the answers of the respondents
- **Disadvantages:** Time-consuming; many target respondents have no public-listed phone numbers or no telephones at all

Classification of Survey Design According to the Span of Time Involved

The span of time needed to complete the survey brings us to the two different types of surveys: cross-sectional and longitudinal.

1. Cross-Sectional Surveys

Collecting information from the respondents at a single period in time uses the cross-sectional type of survey. Cross-sectional surveys usually utilize questionnaires to ask about a particular topic at one point in time. For instance, a researcher conducted a cross-sectional survey asking teenagers' views on cigarette smoking as of May 2010. Sometimes, cross-sectional surveys are used to identify the relationship between two variables, as in a comparative study. An example of this is administering a cross-sectional survey about the relationship of peer pressure and cigarette smoking among teenagers as of May 2010.

2. Longitudinal Surveys

When the researcher attempts to gather information over a period of time or from one point in time up to another, he is doing a longitudinal survey. The aim of longitudinal surveys is to collect data and examine the changes in the data gathered. Longitudinal surveys are used in cohort studies, panel studies and trend studies.

Observation Method of Data Collection

One of the principal methods of collecting data is observation. This research technique is primarily used for qualitative research to gather data about people, objects, events, behaviours, etc., in their natural setting. Researchers watch, listen, take notes, and also record video/audio in their surroundings to get first-hand information on the research topic. There are two approaches to observation:

Participant observation – Researchers become part of their research projects, take part in the events, and may even interact with the other participants. It may alter the behaviour of participants knowing that they are being observed (Hawthorne Effect).

Non-participant observation – Researchers are not involved with anything that happens around them. In this situation, people act more naturally as they are unaware of being watched by someone.

Benefits

Accuracy Because the researcher is there to observe the entire situation in person, data collected through this method is more accurate compared with the other methods. Non-participant observation gets more reliable information because there is no intervention from anyone, and there is no pressure on people to influence their behaviour. In contrast, the researcher doesn't have any means to check the accuracy of the data collected with the help of other methods, namely surveys and interviews.

Easy to organize It happens in a natural environment, so there is no need to "organize" anything. You don't need to find participants or hire an office like in interviews. In other words, you don't spend money on all these things. Additionally, you can also go to that setting once in a while to repeat the same procedure.

Flexibility You can skip the scheduled observation and also can change your location and subjects any time you want. Considering there are a lot of people in certain places, you can change your approach and observe different demographics.

Drawbacks

Time-consuming It may take a while to get the desired result from it, especially if it is a non-participant observation. You are not able to control the situation or ask possible questions. You may need several observations to get any data from it. It is different in one-on-one or group interviews where you have specific and usually open-ended questions related to the research topic, and respondents give feedback according to those questions.

Consent Before participant observation, researchers provide brief information about what they want to observe and make sure if the subjects are comfortable with it. You can't do the same with non-participant observation. After it is finished, you need to ask people's permission to include their activity in your research paper.
Impossibility of observing everything

Questionnaire

A questionnaire is a research instrument that consists of a set of questions or other types of prompts that aims to collect information from a respondent. A research questionnaire is typically a mix of close-ended questions and open-ended questions.

Open-ended, long-form questions offer the respondent the ability to elaborate on their thoughts. Research questionnaires were developed in 1838 by the Statistical Society of London.

The data collected from a data collection questionnaire can be both qualitative as well as quantitative in nature. A questionnaire may or may not be delivered in the form of a survey, but a survey always consists of a questionnaire.

- Questionnaire is as an instrument for research, which consists of a list of questions, along with the choice of answers, printed or typed in a sequence on a form used for acquiring specific information from the respondents.
- In general, questionnaires are delivered to the persons concerned either by post or mail, requesting them to answer the questions and return it.
- Informants are expected to read and understand the questions and reply in the space provided in the questionnaire itself.
- The questionnaire is prepared in such a way that it translates the required information into a series of questions, that informants can and will answer.

Characteristics of a Good Questionnaire

The following are characteristics of good questionnaires:

- It should consist of a well-written list of questions.
- The questionnaire should deal with an important or significant topic to create interest among respondents.
- It should seek only that data which cannot be obtained from other sources.
- It should be as short as possible but should be comprehensive.
- It should be attractive.
- Directions should be clear and complete.
- It should be represented in good psychological order proceeding from general to more specific responses.
- Double negatives in questions should be avoided.
- Putting two questions in one question also should be avoided. Every question should seek to obtain only one specific information.
- It should be designed to collect information which can be used subsequently as data for analysis.

Format of Questions in Questionnaires

The questions asked can take two forms:

- **Restricted questions**, also called closed-ended, ask the respondent to make choices — yes or no, check items on a list, or select from multiple choice answers.
  Restricted questions are easy to tabulate and compile.
- **Unrestricted questions** are open-ended and allow respondents to share feelings and opinions that are important to them about the matter at hand.
  Unrestricted questions are not easy to tabulate and compile, but they allow respondents to reveal the depth of their emotions.
  If the objective is to compile data from all respondents, then sticking with restricted questions that are easily quantified is better.
  If degrees of emotions or depth of sentiment is to be studied, then develop a scale to quantify those feelings.

Uses of Questionnaires

- Questionnaires are a common and inexpensive research tool used by private companies, government departments, individuals, groups, NGOs etc to get feedback, research, collect data from consumer, customers or from general public depending on the need.
- Questionnaires are the most important part of primary surveys.

Advantages of Questionnaire

- One of the greatest benefits of questionnaires lies in their uniformity — all respondents see exactly the same questions.
- It is an inexpensive method, regardless of the size of the universe.
- Free from the bias of the interviewer, as the respondents answer the questions in his own words.
- Respondents have enough time to think and answer.
- Due to its large coverage, respondents living in distant areas can also be reached conveniently.

Limitations of Questionnaire

- The risk of collection of inaccurate and incomplete information is high in the questionnaire, as it might happen that people may not be able to understand the question correctly.
- The rate of non-response is high.

Measurement of Attitudes

- Attitudes are evaluative judgments or feelings that individuals hold toward a particular object, person, group, or situation. Psychologists employ various techniques to gauge and quantify these attitudes. These measurements are invaluable for understanding human behavior, predicting actions, and assessing the effectiveness of interventions.

Techniques of Attitude Measurement

- **Self-Report Scales:** These include Likert scales, Thurstone scales, and semantic differential scales. Respondents indicate their level of agreement or disagreement with statements, providing a quantitative measure of their attitudes.
- **Implicit Measures:** These measures assess automatic or unconscious attitudes that may not be readily apparent through self-report. Common techniques include the Implicit Association Test (IAT) and the affect misattribution procedure (AMP).
- **Behavioral Observations:** Observing individuals' behaviors in real-life or controlled settings can provide insights into their attitudes. For example, marketers may measure consumer attitudes by tracking purchase behaviors.

Issues in attitude measurement

Measurement implies the process of obtaining information which can be subject to analysis. Attitude measurement relates to the process of measuring an individual's attitude towards an object. When we go for measurement of attitudes or any other parameter, one has to clearly sort out the following
• "what" has to be measured ?
• "who" is to be measured ?
• the accuracy desired in the measurement
• the costs permissible
• the choices available in the measurement/data collection techniques.

In attitude measurement, the researcher is primarily interested in measuring the "state of mind" of the respondent (s). It may include factors such as awareness, attitudes and decision processes. An interesting characteristics of these measures is that their verification is rather difficult. There is no way to determine whether the answer given by a respondent to the level of liking for a new product, such as ice-cream mix, represents the "truth" or not. The researcher, unless he is a "telepathist", cannot actually observe the states of mind like preference, likes and dislikes, etc. Such things can only be inferred. It has been stated in the previous section, that attitudes are affected by attributes and beliefs. So, the first step, before embarking on an attitude-measurement exercise, is selecting the relevant attributes of the object under investigation. For instance, the salient attributes of a product like "Shrikhand" may be price, shelf life, flavour, and pack size. For a public distribution system they may be quality of grains, prices, outlet working timings, and assurance of availability. It is clearly impossible to measure every attribute of the process/object under consideration. The researcher should settle for the relevant ones only. It is advisable to measure only those attributes which can be related to actions by the respondents. Exploratory research can be helpful in identifying attributes. The methods used could include nondisguised ones like depth interviews and disguised ones like projective techniques. The depth interviews are the most commonly used technique. They use no structured framework for gathering information. The respondents are. encouraged to talk about the object under investigation and the investigator tries to uncover its salient attributes in this process. This procedure requires skilled investigators. It is also considered costly and the results are prone to bias errors. The projective techniques attempt to uncover the information from the respondent in an indirect manner. The subject is requested to respond to incomplete stimuli here. In doing so, he/she is believed to reveal elements of attitude towards the object that will not be revealed in response to direct queries. The projective techniques used may include a cartoon test, word association test, sentence completion test, etc. Though these techniques also have some disadvantages, they are used

more than the nondisguised methods. The next important issue in attitude measurement is that "who" is to be measured. It involves people. The question to be posed now is of what kind ? Their education, age, sex, occupation, religion etc. may have a bearing on the choice of the measurement method. The measurement procedure must be designed with the characteristics of the respondents under consideration. For instance, using a mail questionnaire for disinterested or hostile respondents would hardly be the right choice as a research instrument.

The third major issue in attitude measurement is the choices in data collection and measurement techniques. The data collection techniques can be categorised into
(a) Questionnaire methods, and
(b) Observational methods.

Usually questionnaires are used for measuring the attitudes.

The approaches for measuring attitudes are as follows:
1) Self-report inventories
2) Using psychological measures like galvanic skin response or pupillary response
3) Projective techniques like thematic a perception test.

The self-report inventories, also known as attitude scales, involve presenting the subjects with a list containing favourable and unfavourable statements about the research topic and ask whether they agree or disagree with each of them. Most attitude measurement methods use the self-report technique. However they differ in terms of the way the scales are constructed and used.

The weaknesses of the self-report measures are that:

1. The results are limited to what the individuals know about their attitudes and are willing to relate,
2. The validity of the verbalised attitudes is questionable.

We will be discussing some of these scales, alongwith their characteristics, in the subsequent sections of this unit. Finally, the last major issue for a managerial researcher here relates to the costs and accuracy desired in the measurement. As has been stated earlier, these type of measurements are never entirely free of inaccuracy. Moreover, cost and accuracy are generally reciprocal properties in measurement. The intimate knowledge of a research instrument can go a long way in the correct interpretation of the results.

Activity 1 List out the salient attributes of the following products

S.N.	Product	Attributes
1)	Toilet Soap	.....
		.....
		.....
2)	Toothpaste	.....
		.....
		.....
		.....
3)	Briefcase	.....
		.....
		.....
		.....
4)	Colour TV	.....
		.....
		.....
5)	Shoes	.....
		.....
		.....
		.....
6)	Camera	.....
		.....
		.....
		.....

Activity 2

You may conduct depth interviews to identify attributes of the products mentioned in Activity 1. Compare it with the one you have already listed out in Activity 1.

.....
.....
.....
.....

Activity 3

List out the three important issues in attitude measurement.

.....
.....
.....
.....
.....
.....

The four scales of measurement

By understanding the scale of the measurement of their data, data scientists can determine the kind of statistical test to perform.

1. Nominal scale of measurement

The nominal scale of measurement defines the identity property of data. This scale has certain characteristics, but doesn't have any form of numerical meaning. The data can be placed into categories but can't be multiplied, divided, added or subtracted from one another. It's also not possible to measure the difference between data points.

Examples of nominal data include eye colour and country of birth. Nominal data can be broken down again into three categories:

- Nominal with order: Some nominal data can be sub-categorised in order, such as "cold, warm, hot and very hot."
- Nominal without order: Nominal data can also be sub-categorised as nominal without order, such as male and female.
- Dichotomous: Dichotomous data is defined by having only two categories or levels, such as "yes' and 'no'.

2. Ordinal scale of measurement

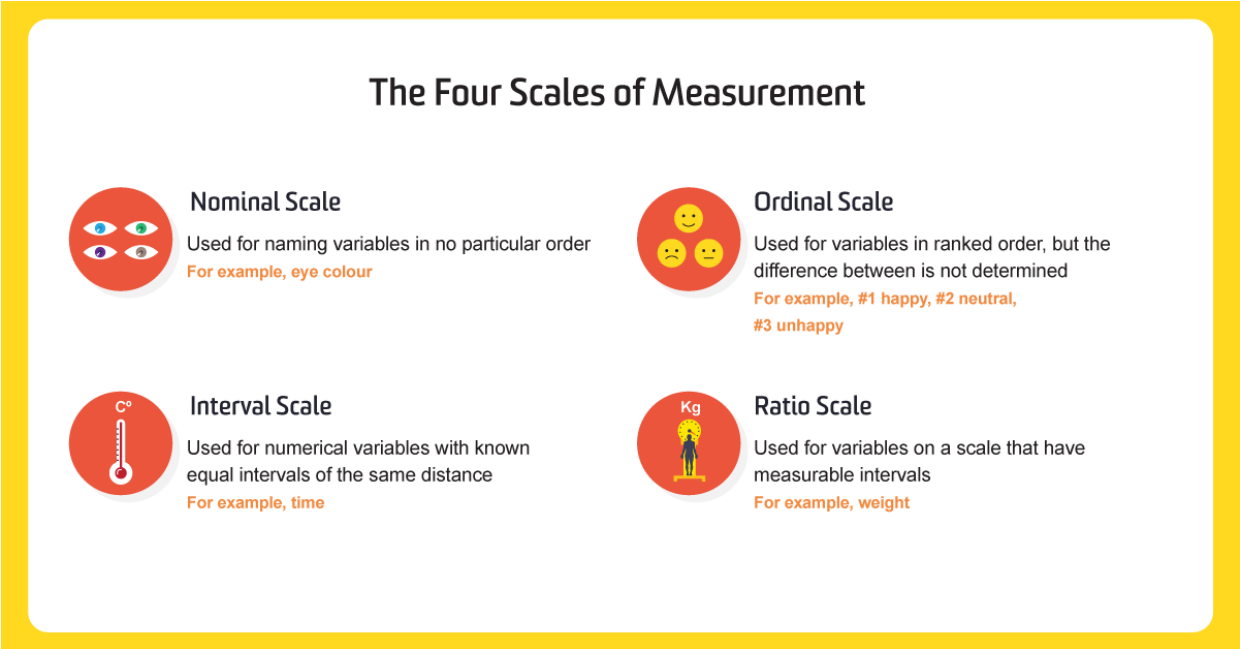
- The ordinal scale defines data that is placed in a specific order. While each value is ranked, there's no information that specifies what differentiates the categories from each other. These values can't be added to or subtracted from.
- An example of this kind of data would include satisfaction data points in a survey, where 'one = happy, two = neutral and three = unhappy.' Where someone finished in a race also describes ordinal data. While first place, second place or third place shows what order the runners finished in, it doesn't specify how far the first-place finisher was in front of the second-place finisher.

3. Interval scale of measurement

- The interval scale contains properties of nominal and ordered data, but the difference between data points can be quantified. This type of data shows both the order of the variables and the exact differences between the variables. They can be added to or subtracted from each other, but not multiplied or divided. For example, 40 degrees is not 20 degrees multiplied by two.
- This scale is also characterised by the fact that the number zero is an existing variable. In the ordinal scale, zero means that the data does not exist. In the interval scale, zero has meaning – for example, if you measure degrees, zero has a temperature.
- Data points on the interval scale have the same difference between them. The difference on the scale between 10 and 20 degrees is the same between 20 and 30 degrees. This scale is used to quantify the difference between variables, whereas the other two scales are used to describe qualitative values only. Other examples of interval scales include the year a car was made or the months of the year.

4. Ratio scale of measurement

- Ratio scales of measurement include properties from all four scales of measurement. The data is nominal and defined by an identity, can be classified in order, contains intervals and can be broken down into exact value. Weight, height and distance are all examples of ratio variables. Data in the ratio scale can be added, subtracted, divided and multiplied.
- Ratio scales also differ from interval scales in that the scale has a 'true zero'. The number zero means that the data has no value point. An example of this is height or weight, as someone cannot be zero centimetres tall or weigh zero kilos – or be negative centimetres or negative kilos. Examples of the use of this scale are calculating shares or sales. Of all types of data on the scales of measurement, data scientists can do the most with ratio data points.



To summarise, nominal scales are used to label or describe values. Ordinal scales are used to provide information about the specific order of the data points, mostly seen in the use of satisfaction surveys. The interval scale is used to understand the order and differences between them. The ratio scales gives more information about identity, order and difference, plus a breakdown of the numerical detail within each data point.

Reliability & Validity of Scales

Validity:

Validity is the extent to which an instrument measures what it is supposed to measure and performs as it is designed to perform. Does the measure employed really measure the theoretical concept (variable)? It is rare, if nearly impossible, that an instrument be 100% valid, so validity is generally measured in degrees. As a process, validation involves collecting and analyzing data to assess the accuracy of an instrument. There are numerous statistical tests and measures to assess the validity of quantitative instruments, which generally involves pilot testing. The remainder of this discussion focuses on external validity and content validity.

External validity is the extent to which the results of a study can be generalized from a sample to a population. Establishing eternal validity for an instrument, then, follows directly from sampling. Recall that a sample should be an accurate representation of a population, because the total population may not be available. An instrument that is externally valid helps obtain population generalizability, or the degree to which a sample represents the population.

Content validity refers to the appropriateness of the content of an instrument. In other words, do the measures (questions, observation logs, etc.) accurately assess what you want to know? This is particularly important with achievement tests. This would involve taking representative questions from each of the sections of the unit and evaluating them against the desired outcomes.

Reliability:

a. Will the measure employed repeatedly on the same individuals yield similar results? (stability)

b. Will the measure employed by different investigators yield similar results? (equivalence)

c. Will a set of different operational definitions of the same concept employed on the same individuals, using the same data-collecting technique, yield a highly correlated result? Or, will all items of the measure be internally consistent? (homogeneity) Reliability can be thought of as consistency. Does the instrument consistently measure what it is intended to measure? It is not possible to calculate reliability; however, there are four general estimators that you may encounter in reading research:

1. Inter-Rater/Observer Reliability: The degree to which different raters/observers give consistent answers or estimates.
2. Test-Retest Reliability: The consistency of a measure evaluated over time.
3. Parallel-Forms Reliability: The reliability of two tests constructed the same way, from the same content.
4. Internal Consistency Reliability: The consistency of results across items, often measured with Cronbach's Alpha.

Relating Reliability and Validity

Reliability is directly related to the validity of the measure. There are several important principles. First, a test can be considered reliable, but not valid. Consider the SAT, used as a predictor of success in college. It is a reliable test (high scores relate to high GPA), though only a moderately valid indicator of success (due to the lack of structured environment – class attendance, parent-regulated study, and sleeping habits – each holistically related to success).

Second, validity is more important than reliability. Using the above example, college admissions may consider the SAT a reliable test, but not necessarily a valid measure of other quantities colleges seek, such as leadership capability, altruism, and civic involvement. The combination of these aspects, alongside the SAT, is a more valid measure of the applicant's potential for graduation, later social involvement, and generosity (alumni giving) toward the alma mater.

Finally, the most useful instrument is both valid and reliable. Proponents of the SAT argue that it is both. It is a moderately reliable predictor of future success and a moderately valid measure of a student's knowledge in Mathematics, Critical Reading, and Writing.

UNIT 5

Survey Administration

In **survey administration** , marketers and researchers have to establish first their goals prior to the actual survey. What is it they want? How are they going to utilize the collected data? They also have to identify on what means and capacity they are to achieve their objectives. Remember that any form of data collection such as a marketing survey, requires and can exhaust resources. Therefore, it is only right to employ the most fitting data gathering approach depending on the survey questions. In addition, the sample population will then have to be identified. Who do you want to elicit information from? Lastly, the method of data collection will be determined. How will you bring out the data?

B2B or B2C marketers and market researchers are given different choices on how to administer a marketing survey. Each approach have their own merits and demerits, which should be taken into account and evaluated thoroughly before embarking on the survey process.

Survey Administration Methods

Basically, there are two classifications of approaches in administering a survey: personal approach and self-administered approach. A personal approach survey can be a face-to-face interview or a telephone interview. A face-to-face interview generally generates a good response rate; however, it presents a higher likelihood for bias as a result of the interplay between the surveyor and the surveyee. On the contrary, a telephone survey offers better obscurity and confidentiality compared to a face-to-face interview. Be that as it may, this type of survey is impractical to use of there are lengthy questions involved.

A self-administered approach includes paper-and-pencil survey, online survey, and mail survey. A paper-and-pencil survey is suggested if the respondents have no access to computers or they do not know how to use a computer. The downside of this survey is that it is time-consuming for the survey forms have to be manually disseminated. Survey administrators are also required to be physically present during the entire data collection process. As for an online survey, it is optimal for marketing researches that involve large sample size and diverse demographics. The respondents, however, should be computer literate in order to answer the questions. Among the three, mail survey is probably the easiest to supervise and carry out. However, with today's technology, mail surveys are becoming less and less as an option.

Response Rate

Response rates are very critical when administering a survey. During the data collection process, the surveyor would want all the respondents to answer the survey completely. In order to improve the response rate, researchers do pilot testing. It eliminates stringent potential obstacles like poorly-phrased questionnaires. Other suggestions that will likely engage respondents are giving them

incentives, guaranteeing confidentiality and/or anonymity, creating a professional-looking questionnaire, and adhering to the KISS precept or Keeping It Short and Simple. For those who will conduct the survey, the rule of thumb is to look professional, mannerly, and affable. And don't forget to always say "please," and "thank you."

Pointers in Conducting Survey Administration

- **Approach for Collecting Data**– Can the data be collected elsewhere? Is there already an existing data for this topic? What method is optimal for this area of concern? Will random sampling work? Questions like these need to be considered when deciding for the data sampling technique.
- **Survey Length**– Always keep the survey short. Keep in mind that you're asking for the data you need to know, not those that you like to know.
- **Survey Questions**– Obtain diverse responses on your survey questions. Be on point. Remember to ask yourself if you are asking the question you think you are asking.
- **Survey Timing**– According to research, you can get the best response rates if the surveys were sent out or conducted on Mondays.
- **Survey Request**– Make your surveys catchy, appealing, and fun. Do not forget to indicate the survey's completion time. Is your survey a matter of social responsibility? Or an incentive-driven research?
- **Survey Structure**– Since it is common for respondents to drop out as the survey keep going, ask the important questions right away. Also, refrain from leading and confusing questions. When there is a scale for options, include an even number of option. This causes the respondents to establish an opinion, whether they concur or dissent, against to being indifferent or neutral.

Sampling

When you conduct research about a group of people, it's rarely possible to collect data from every person in that group. Instead, you select a **sample**. The sample is the group of individuals who will actually participate in the research.

To draw valid conclusions from your results, you have to carefully decide how you will select a sample that is representative of the group as a whole. This is called a **sampling method**. There are two primary types of sampling methods that you can use in your research:

- **Probability sampling** involves random selection, allowing you to make strong statistical inferences about the whole group.
- **Non-probability sampling** involves non-random selection based on convenience or other criteria, allowing you to easily collect data.

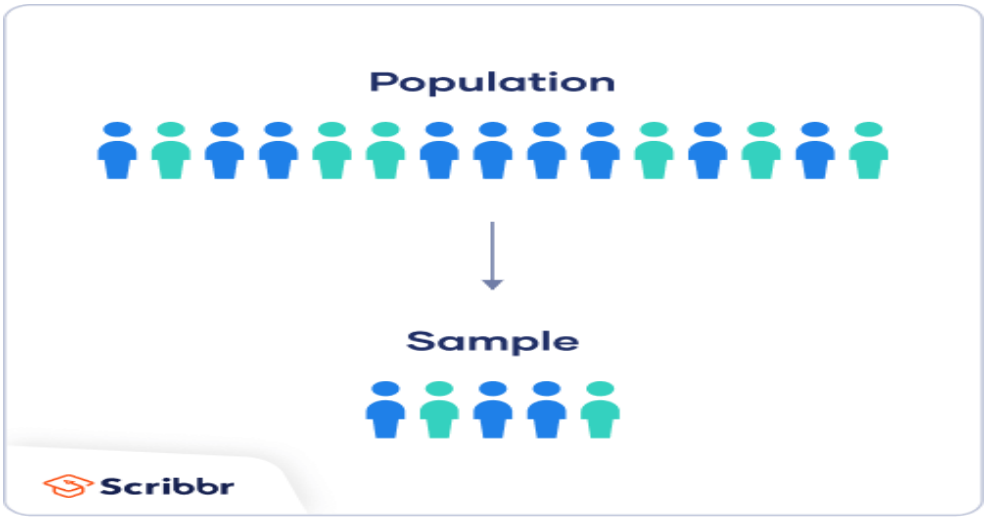
You should clearly explain how you selected your sample in the methodology section of your paper or thesis, as well as how you approached minimizing research bias in your work.

Population vs. sample

First, you need to understand the difference between a population and a sample, and identify the target population of your research.

- The **population** is the entire group that you want to draw conclusions about.
- The **sample** is the specific group of individuals that you will collect data from.

The population can be defined in terms of geographical location, age, income, or many other characteristics.



It can be very broad or quite narrow: maybe you want to make inferences about the whole adult population of your country; maybe your research focuses on customers of a certain company, patients with a specific health condition, or students in a single school.

It is important to carefully define your target population according to the purpose and practicalities of your project.

If the population is very large, demographically mixed, and geographically dispersed, it might be difficult to gain access to a representative sample. A lack of a representative sample affects the validity of your results, and can lead to several research biases, particularly sampling bias.

Sampling frame

The sampling frame is the actual list of individuals that the sample will be drawn from. Ideally, it should include the entire target population (and nobody who is not part of that population).

Example: Sampling frame

You are doing research on working conditions at a social media marketing company. Your population is all 1000 employees of the company. Your sampling frame is the company's HR database, which lists the names and contact details of every employee.

Sample size

The number of individuals you should include in your sample depends on various factors, including the size and variability of the population and your research design. There are different sample size calculators and formulas depending on what you want to achieve with statistical analysis.

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- Academic style
- Vague sentences
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- Style consistency

Probability sampling methods

Probability sampling means that every member of the population has a chance of being selected. It is

mainly used in quantitative research. If you want to produce results that are representative of the whole population, probability sampling techniques are the most valid choice.

There are four main types of probability sample.

1. Simple random sampling

In a simple random sample, every member of the population has an equal chance of being selected. Your sampling frame should include the whole population.

To conduct this type of sampling, you can use tools like random number generators or other techniques that are based entirely on chance.

Example: Simple random samplingYou want to select a simple random sample of 1000 employees of a social media marketing company. You assign a number to every employee in the company database from 1 to 1000, and use a random number generator to select 100 numbers.

2. Systematic sampling

Systematic sampling is similar to simple random sampling, but it is usually slightly easier to conduct. Every member of the population is listed with a number, but instead of randomly generating numbers, individuals are chosen at regular intervals.

Example: Systematic samplingAll employees of the company are listed in alphabetical order. From the first 10 numbers, you randomly select a starting point: number 6. From number 6 onwards, every 10th person on the list is selected (6, 16, 26, 36, and so on), and you end up with a sample of 100 people.

If you use this technique, it is important to make sure that there is no hidden pattern in the list that might skew the sample. For example, if the HR database groups employees by team, and team members are listed in order of seniority, there is a risk that your interval might skip over people in junior roles, resulting in a sample that is skewed towards senior employees.

3. Stratified sampling

Stratified sampling involves dividing the population into subpopulations that may differ in important ways. It allows you draw more precise conclusions by ensuring that every subgroup is properly represented in the sample.

To use this sampling method, you divide the population into subgroups (called strata) based on the relevant characteristic (e.g., gender identity, age range, income bracket, job role).

Based on the overall proportions of the population, you calculate how many people should be sampled from each subgroup. Then you use random or systematic sampling to select a sample from each subgroup.

Example: Stratified sampling

The company has 800 female employees and 200 male employees. You want to ensure that the sample reflects the gender balance of the company, so you sort the population into two strata based on gender. Then you use random sampling on each group, selecting 80 women and 20 men, which gives you a representative sample of 100 people.

4. Cluster sampling

Cluster sampling also involves dividing the population into subgroups, but each subgroup should have similar characteristics to the whole sample. Instead of sampling individuals from each subgroup, you randomly select entire subgroups.

If it is practically possible, you might include every individual from each sampled cluster. If the clusters themselves are large, you can also sample individuals from within each cluster using one of the techniques above. This is called multistage sampling.

This method is good for dealing with large and dispersed populations, but there is more risk of error in the sample, as there could be substantial differences between clusters. It's difficult to guarantee that the sampled clusters are really representative of the whole population.

Example: Cluster sampling

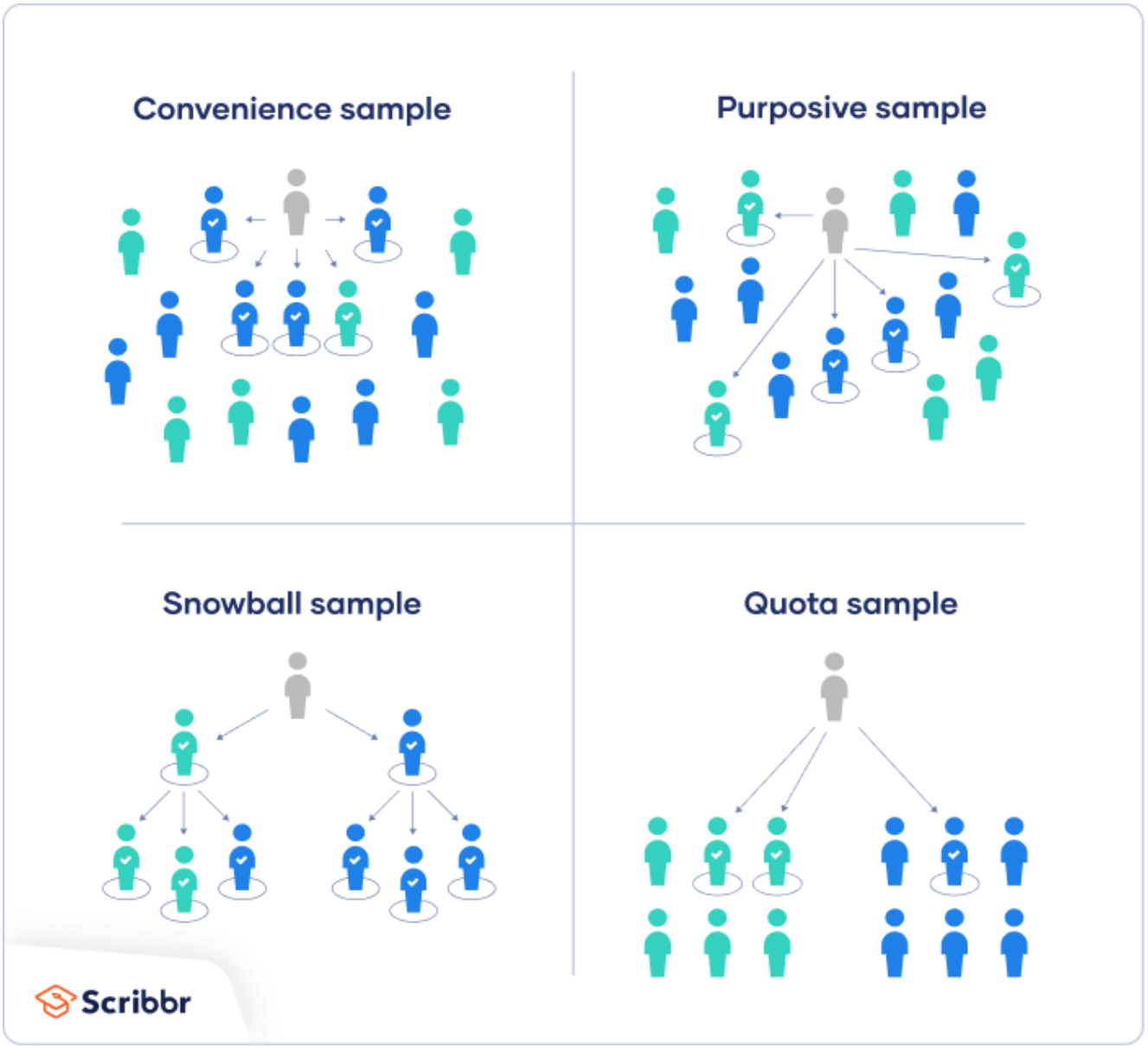
The company has offices in 10 cities across the country (all with roughly the same number of employees in similar roles). You don't have the capacity to travel to every office to collect your data, so you use random sampling to select 3 offices – these are your clusters.

Non-probability sampling methods

In a non-probability sample, individuals are selected based on non-random criteria, and not every individual has a chance of being included.

This type of sample is easier and cheaper to access, but it has a higher risk of sampling bias. That means the inferences you can make about the population are weaker than with probability samples, and your conclusions may be more limited. If you use a non-probability sample, you should still aim to make it as representative of the population as possible.

Non-probability sampling techniques are often used in exploratory and qualitative research. In these types of research, the aim is not to test a hypothesis about a broad population, but to develop an initial understanding of a small or under-researched population.



1. Convenience sampling

A convenience sample simply includes the individuals who happen to be most accessible to the researcher.

This is an easy and inexpensive way to gather initial data, but there is no way to tell if the sample is representative of the population, so it can't produce generalizable results. Convenience samples are at risk for both sampling bias and selection bias.

Example: Convenience sampling

You are researching opinions about student support services in your university, so after each of your classes, you ask your fellow students to complete a survey on the topic. This is a convenient way to gather data, but as you only surveyed students taking the same classes as you at the same level, the sample is not representative of all the students at your university.

2. Voluntary response sampling

Similar to a convenience sample, a voluntary response sample is mainly based on ease of access. Instead of the researcher choosing participants and directly contacting them, people volunteer themselves (e.g.

by responding to a public online survey).

Voluntary response samples are always at least somewhat biased, as some people will inherently be more likely to volunteer than others, leading to self-selection bias.

Example: Voluntary response sampling

You send out the survey to all students at your university and a lot of students decide to complete it. This can certainly give you some insight into the topic, but the people who responded are more likely to be those who have strong opinions about the student support services, so you can't be sure that their opinions are representative of all students.

3. Purposive sampling

This type of sampling, also known as judgement sampling, involves the researcher using their expertise to select a sample that is most useful to the purposes of the research.

It is often used in qualitative research, where the researcher wants to gain detailed knowledge about a specific phenomenon rather than make statistical inferences, or where the population is very small and specific. An effective purposive sample must have clear criteria and rationale for inclusion. Always make sure to describe your inclusion and exclusion criteria and beware of observer bias affecting your arguments.

Example: Purposive sampling

You want to know more about the opinions and experiences of disabled students at your university, so you purposefully select a number of students with different support needs in order to gather a varied range of data on their experiences with student services.

4. Snowball sampling

If the population is hard to access, snowball sampling can be used to recruit participants via other participants. The number of people you have access to "snowballs" as you get in contact with more people. The downside here is also representativeness, as you have no way of knowing how representative your sample is due to the reliance on participants recruiting others. This can lead to sampling bias.

Example: Snowball sampling

You are researching experiences of homelessness in your city. Since there is no list of all homeless people in the city, probability sampling isn't possible. You meet one person who agrees to participate in the research, and she puts you in contact with other homeless people that she knows in the area.

5. Quota sampling

Quota sampling relies on the non-random selection of a predetermined number or proportion of units. This is called a quota.

You first divide the population into mutually exclusive subgroups (called strata) and then recruit sample units until you reach your quota. These units share specific characteristics, determined by you prior to forming your strata. The aim of quota sampling is to control what or who makes up your sample.

Example: Quota sampling

You want to gauge consumer interest in a new produce delivery service in Boston, focused on dietary preferences. You divide the population into meat eaters, vegetarians, and vegans, drawing a sample of 1000 people. Since the company wants to cater to all consumers, you set a quota of 200 people for each dietary group. In this way, all dietary preferences are equally represented in your research, and you can

easily compare these groups.

You continue recruiting until you reach the quota of 200 participants for each subgroup.

Selecting the appropriate statistical technique

Selecting the appropriate statistical technique depends on the type of data, the research question, and the relationships or patterns you're trying to analyze. Here's a step-by-step guide to help you choose the right technique:

1. Define Your Objective

What do you want to do with your data?

- **Descriptive Statistics**: Summarize or describe data.
- **Inferential Statistics**: Make predictions or test hypotheses.
- **Exploratory Data Analysis**: Discover patterns, anomalies, or relationships.

2. Identify the Type of Data

- **Qualitative (Categorical)**: e.g., Gender, Occupation, Yes/No responses.
  - Nominal: No order (e.g., colors, names).
  - Ordinal: Ordered categories (e.g., education level).
- **Quantitative (Numerical)**: e.g., Age, Income, Height.
  - Interval: No true zero (e.g., temperature).
  - Ratio: True zero (e.g., weight, distance).

3. Determine the Number of Variables

- **Univariate Analysis**: One variable at a time.
- **Bivariate Analysis**: Two variables, examining relationships or differences.
- **Multivariate Analysis**: More than two variables.

4. Match Your Objective with Techniques

A. Descriptive Analysis

- Central tendency: Mean, Median, Mode.
- Variability: Range, Standard Deviation, Variance.

B. Comparison Techniques

- Comparing means:
  - **t-test**: Two groups (e.g., Male vs. Female test scores).
  - **ANOVA**: More than two groups.
- Comparing proportions:
  - **Chi-square test**: Association between categorical variables.

C. Relationship Techniques

- Correlation:
  - **Pearson's correlation**: Linear relationships (numerical data).
  - **Spearman's rank correlation**: Monotonic relationships (ordinal data).
- Regression:
  - **Linear Regression**: One predictor.
  - **Multiple Regression**: Several predictors.
  - **Logistic Regression**: Binary outcome (e.g., pass/fail).

D. Predictive/Classification Techniques

- Machine Learning models:
  - **Decision Trees**, **Random Forest**, **SVM**, etc.

E. Time-Series Analysis

- **ARIMA** or **Exponential Smoothing**: Trends over time.

F. Multivariate Analysis

- Factor Analysis.
- Principal Component Analysis (PCA).
- MANOVA.

5. Check Assumptions for the Test

Before applying the test, verify:

- Normality (for parametric tests).
- Homogeneity of variance.
- Data independence.

6. Tools

Use software tools like **SPSS**, **R**, **Python**, or **Excel** to apply and validate techniques.

Tabulation of data

Tabulation is a systematic and logical representation of numeric data in rows and columns to facilitate comparison and statistical analysis. It facilitates comparison by bringing related information close to each other and helps in statistical analysis and interpretation.

In other words, the method of placing organised data into a tabular form is known as tabulation. It may be complex, double, or simple, depending upon the nature of categorisation.

Objectives Of Tabulation:

(1) To simplify complex data

- It reduces the bulk of information, i.e., it reduces raw data in a simplified and meaningful form so that it can be easily interpreted by a common man in less time.

(2) To bring out essential features of data

- It brings out the chief/main characteristics of data.
- It presents facts clearly and precisely without textual explanation.

(3) To facilitate comparison

- The representation of data in rows and columns is helpful in simultaneous detailed comparison on the basis of several parameters.

(4) To facilitate statistical analysis

- Tables serve as the best source of organised data for statistical analysis.
- The task of computing average, dispersion, correlation, etc., becomes easier if data is presented in the form of a table.

(5) To save space

- A table presents facts in a better way than the textual form.
- It saves space without sacrificing the quality and quantity of data.

Hypothesis Testing

Hypothesis can be referred to as the interpretation of certain facts which is just a possible solution or a tentative answer to a problem and is completely or partly unverified in nature. Then afterwards on its establishment, it ceases to be a hypothesis and then finally becomes a theory or a principle. The word 'Hypothesis' has come from the Greek word hypo (means under)and tithenas (means to place) together these words indicate towards the support they provide to each other on the placement of the hypothesis under the evidence, which acts as a foundation.

Step 1: State the Null Hypothesis.

The null hypothesis can be thought of as the opposite of the "guess" the research made (in this example the biologist thinks the plant height will be different for the fertilizers). So the null would be that there will be no difference among the groups of plants. Specifically in more statistical language the null for an ANOVA is that the means are the same. We state the Null hypothesis as:

$H_0 : \mu_1 = \mu_2 = \cdots = \mu_k$

for k levels of an experimental treatment.

Step 2: State the Alternative Hypothesis.

H_1 : treatment level means not all equal

The reason we state the alternative hypothesis this way is that if the Null is rejected, there are many possibilities.For example, $\mu_1 \neq \mu_2 = \cdots = \mu_k$ is one possibility, as is $\mu 1 = \mu 2 \neq \mu 3 = \cdots = \mu k$. Many people make the mistake of stating the Alternative Hypothesis as: $\mu 1 \neq \mu 2 \neq \cdots \neq \mu k$ which says that every mean differs from every other mean. This is a possibility, but only one of many possibilities. To cover all alternative outcomes, we resort to a verbal statement of 'not all equal' and then follow up with mean comparisons to find out where differences among means exist. In our example, this means that fertilizer 1 may result in plants that are really tall, but fertilizers 2, 3 and the plants with no fertilizers don't differ from one another. A simpler way of thinking about this is that at least one mean is different from all others.

Step 3: Set α (Significance level)

If we look at what can happen in a hypothesis test, we can construct the following contingency table:

	In Reality	
Decision	H_0 is TRUE	H_0 is FALSE
Accept H_0	OK	Type II Error β = probability of Type II Error
Reject H_0	Type I Error α = probability of Type I Error	OK

You should be familiar with type I and type II errors from your introductory course. It is important to note that we want to set α before the experiment (a-priori) because the Type I error is the more 'grevious' error to make. The typical value of α is 0.05, establishing a 95% confidence level. **For this course we will assume α =0.05.**

Step 4: Collect Data

Remember the importance of recognizing whether data is collected through an experimental design or observational.

Step 5: Calculate a test statistic.

For categorical treatment level means, we use an F statistic, named after R.A. Fisher. We will explore the mechanics of computing the F statistic beginning in Lesson 2. The F value we get from the data is labeled $F_{calculated}$.

Step 6: Construct Acceptance / Rejection regions.

As with all other test statistics, a threshold (critical) value of F is established. This F value can be obtained from statistical tables, and is referred to as $F_{critical}$ or $F\ \alpha$. As a reminder, this critical value is the minimum value for the test statistic (in this case the F test) for us to be able to reject the null.

The F distribution, $F\ \alpha$, and the location of Acceptance / Rejection regions are shown in the graph below:

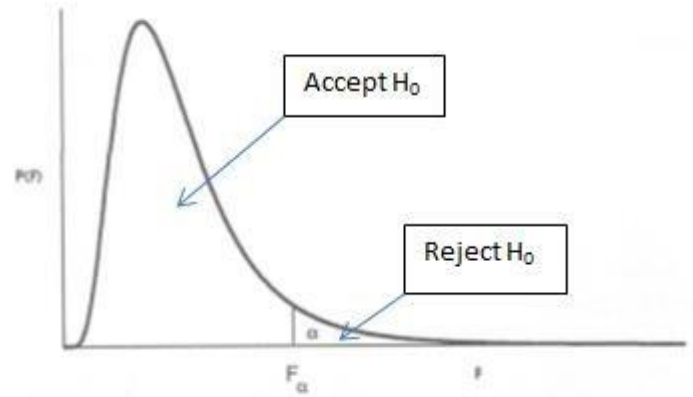


Figure K.1: The F distribution

Step 7: Based on steps 5 and 6, draw a conclusion about H_0.

If the $F_{calculated}$ from the data is larger than the Fα, then you are in the Rejection region and you can reject the Null Hypothesis with (1-α) level of confidence.

Note that modern statistical software condenses step 6 and 7 by providing a p-value. The p-value here is the probability of getting an $F_{calculated}$ even greater than what you observe. If by chance, the $F_{calculated}$ = $F\ \alpha$, then the p-value would exactly equal to α. With larger $F_{calculated}$ values, we move further into the rejection region and the p-value becomes less than α. So the decision rule is as follows:

If the p-value obtained from the ANOVA is less than α, then Reject H_0 and Accept H_A.

Errors In Hypothesis Testing

Type I Error (False Positive Error)
1) A type I error occurs when the null hypothesis is true, but is rejected. Let me say this again, a type I error occurs when the null hypothesis is actually **true**, but was rejected as **false** by the testing.
2) A type I error, or false positive, is asserting something as true when it is actually false. This false positive error is basically a "false alarm" – a result that indicates a given condition has been fulfilled when it actually has not been fulfilled (i.e., erroneously a positive result has been assumed).

Type II Error (False Negative)
1) A type II error occurs when the null hypothesis is false, but erroneously fails to be rejected. Let me say this again, a type II error occurs when the null hypothesis is actually **false**, but was accepted as **true** by the testing.

2) A type II error, or false negative, is where a test result indicates that a condition failed, while it actually was successful. A Type II error is committed when we fail to believe a true condition.
A tabular relationship between truthfulness/falseness of the null hypothesis and outcomes of the test can be seen in the table below:

	Null Hypothesis is true	**Null hypothesis is false**
Reject null hypothesis	Type I Error**False Positive**	**Correct Outcome**True Positive
Fail to reject null hypothesis	**Correct outcome**True Negative	Type II Error**False Negative**

Let's look at some business related examples. In these examples I have reworded the null hypothesis, so be careful on the cost assessment.

Null Hypothesis	**Type I Error / False Positive**	**Type II Error / False Negative**
Medicine A cures Disease B	(H_0 **true**, but rejected as **false**)Medicine A **cures** Disease B, but is **rejected as false**	(H_0 **false**, but accepted as **true**)Medicine A **does not cure** Disease B, but is **accepted as true**
Cost Assessment	Lost opportunity cost for rejecting an effective drug that could cure Disease B	Unexpected side effects (maybe even death) for using a drug that is not effective

Let's try one more.

Null Hypothesis	**Type I Error / False Positive**	**Type II Error / False Negative**
Display Ad A is effective in driving c onversions	(H_0 **true**, but rejected as **false**)Display Ad A **is effective** in driving conversions, but is **rejected as false**	(H_0 **false**, but accepted as **true**)Display Ad A is **not effective** in driving conversions, but is **accepted as true**
Cost Assessment	Lost opportunity cost for rejecting an effective Display Ad A	Lost sales for promoting an ineffective Display Ad A to your target visitors

The cost ramifications in the medicine example are quite substantial, so additional testing would likely be justified in order to minimize the impact of the type II error (using an ineffective drug) in our example. However, the cost ramifications in the Display Ad example are quite small, for both the type I and type II errors, so additional investment in addressing the type I and type II errors is probably not worthwhile

Parametric & Non Parametric Tests

1) **Parametric Test:** If the information about the population is completely known by means of its parameters then statistical test is called parametric test∗ Eg: t- test, f-test, z-test, ANOVA are Parametric Tests.
2) **Non parametric test:** If there is no knowledge about the population or parameters, but still it is required to test the hypothesis of the population. Then it is called non-parametric test∗ E.g.: Mann-Whitney, rank sum test, Kruskal-Wallis test
3) **Classification Of hypothesis :** Parametric test Non Parametric test ,t- test, f-test, z-test, ANOVA , Mann-Whitney, rank sum test, Kruskal-Wallis test

4) **Difference between parametric and Non parametric:** Non Parametric Information about population is completely known .No information about the population is available . Specific assumptions are made regarding the population .No assumptions are made regarding the population. Null hypothesis is made on parameters of the population distribution .The null hypothesis is free from parameters .

5) **Difference between parametric and Nonparametric Parametric** Non Parametric Test statistic is based on the distribution Test statistic is arbitrary .Parametric tests are applicable only for variable .It is applied both variable and attributes No parametric test exist for Nominal scale data .Non parametric test do exist for nominal and ordinal scale data Parametric test is powerful, if it exist It is not so powerful like parametric test

6) **Advantages of non parametric test**: Non parametric test are simple and easy to understand∗ It will not involve complicated sampling theory∗ No assumption is made regarding the parent population∗ This method is only available for nominal scale data∗ This method are easy applicable for attribute dates.

7) **Disadvantages of non parametric test:** It can be applied only for nominal or ordinal scale∗ For any problem, if any parametric test exist it is highly powerful.∗ Non parametric methods are not so efficient as of parametric test∗ No nonparametric test available for testing the interactional analysis of variance model.

Report Writing

Research reports are recorded data prepared by researchers or statisticians after analyzing the information gathered by conducting organized research, typically in the form of surveys or qualitative methods.

A research report is a reliable source to recount details about a conducted research. It is most often considered to be a true testimony of all the work done to garner specificities of research.

The various sections of a research report are:

1. Summary
2. Background/Introduction
3. Implemented Methods
4. Results based on Analysis
5. Deliberation
6. Conclusion

Characteristics of a Research Report:

1. Information collected in the report must be **relevant and focused** to derive desired results. Pictorial and graphical presentation of data and related information help to understand the details easily. There is a possibility that the collected data in the report needs to be represented at many places in different formats to fulfill the report goals. The ultimate goal is to determine all the issue and make suitable strategies to cope up with these issue or problems.
2. Report should follow the exact **predefined goals and objectives**. If there is any sort of divergence of related information which does not match the goals then the results are of no use. In fact there is a probability of landing up in making negative or out of focus strategies, which will be very dangerous.
3. The report should always contain the executive **summary of the work**. This is generally kept before the actual report starts as it shows the summary of the desired business plan.
4. Apart from the actual analysis the report should also depict the reasons of making this report and what advantages and profit it can provide after successful implementation of business plans described inside the report.
5. It should also contain the **methodology of the research** which shows the overall process adopted to create the report.
6. It is important that the report contains the possibility of errors in any of the module or process so that immediate measures could be taken to cope up with these errors.
7. The report should contain the **description of the questionnaires** used in analysis and the way it has been prepared.
8. The methodology used in the interviews should also be elaborated and what was achieved in this should also be described.
9. If the information show that some aspects needs to predict the future trends then the reports should depict that prediction. This prediction should have scale of success so that the accuracy could be judged efficaciously. The report should also define each and every variable and element used in creating these predictive analyses.
10. The report should be **flexible** enough to be changed accordingly. The analytical information described inside the report should be maintained in such a way that there is no extra effort labored if any strategy or process it to be changed in future. It should necessarily mould the changes without changing the structure of the report.

Types of Research Reports

1) Journal Articles
2) Peer review
3) Blind review
4) Primary vs. secondary source
5) Presentations at conferences
6) Theses and Dissertations
7) Books

Content of Research Journal Article

1) Abstract – 100 to 200 words maxIntroduction
2) Variables under study
3) Purpose
4) Research questions/ or hypotheses
5) Literature review
6) Theoretical framework
7) Significance
8) Methodology

- Sample
- Research design
- Measurement tools
- Data collection
- Procedures

9) Results-findings

- Statistical tests
- Value of calculated statistic
- Significance (statistical) .05 or .01 usually